REPORT OF THE COUNCIL FOR THE OFFICIAL YEAR 1897–98.

Approved and adopted by the Annual General Meeting, 2nd May 1898.

Mr. H. L. Florence, *Vice-President*, in the Chair.

SINCE the publication of the last Annual Report on the 6th May 1897 the Council have held 24 meetings, of which the Council elected on the 14th June 1897 have held 18. These are exclusive of meetings held by Committees of Council.

In the course of the year 8 Fellows have been elected, 31 Associates, 3 Hon. Associates, and 9 Hon. Corr. Members. The numbers in each class of subscribing members stand as follows:—Fellows 597; Associates 1,001; Hon. Associates 52.

The following gentlemen have been elected as Honorary Corresponding Members:—MM. Jean Jacques Winders (Antwerp), Alexandre Charles Arthur, Comte de Marsy (Compiègne, France), Jean Théophile Homolle (Paris), El Conde de San Januario (Madrid), Johan Louis Ussing (Copenhagen), Settimio Fedele Gerardo Giampietri (Rome), Arnaldo Rodondo Adães Bermudes (Lisbon), Leopold Eidlitz (New York), Valère Dumortier (Brussels).

The losses by death to the Institute during the past year have been numerous and serious. They are as follows:—*Fellows*: Arthur Baker, Daniel Birkett, W. Stevens Cross, James Edmeston, Octavius Hansard, John L. Pearson, R.A., C. J. Phipps, C. J. Shoppee, W. S. Witherington. *Associates*: Joseph Battye, C. A. Chastel de Boinville, A. J. Forge, C. J. Gladman, George Kenyon, George Orrell, H. Stone Wood. *Hon. Associates*: Sir Henry Bessemer, F.R.S., the Hon. Charles Alexander Gore, Alfred Morrison. *Retired Fellow*: George Elkington. *Hon. Corr. Member*: Augustus Laver (San Francisco).

In John Loughborough Pearson, R.A. (*Royal Gold Medallist* 1880), the Council mourn the loss of one of the most distinguished members of the Institute. A special memoir will be found on p. 113 of the current volume. Octavius Hansard was for many years a member of the Council, well known to most of the older members of the Institute; and James Edmeston for a number of years was chairman of the Architectural Union Company.

Preliminary and Intermediate Examinations were held in June and November 1897 in London, Manchester, and Bristol, and Final Examinations in London. The results are shown in the following tabulated forms:—

THE PRELIMINARY EXAMINATION.

—	Examined	Exempted	Passed	Relegated	Failed
Summer	93	37	53	34	6
Autumn	80	33	47	33	—
Totals	173	70	100	67	6

THE INTERMEDIATE EXAMINATION.

	Examined	Passed	Relegated	Failed
Summer	58	35	23	—
Autumn	63	35	28	1
Totals	121	70	51	1
FINAL AND SPECIAL EXAMINATIONS QUALIFYING FOR CANDIDATURE AS ASSOCIATE.				
Summer	33	15	18	—
Autumn	20	9	11	—
Totals	53	24	29	—

Thus it will be seen that during the year 170 gentlemen have been registered as *Probationers*, the number of whom now stands at 988; and 69 gentlemen have been registered as *Students*, the number of whom now stands at 248.

The Arthur Cates Prizes for the best set of Testimonies of Study submitted by Students for admission to the Final Examination have been awarded to Mr. Percy Morris [*A.*] for the June Examination, and to Mr. Laurence Hobson [*A.*] for the November Examination.

The Ashpitel Prize has not been awarded this year.

The Council have to thank the Allied Societies at Manchester and Bristol for their help in conducting examinations at those centres during the year.

The Board of Examiners, after numerous meetings and anxious consideration, have prepared a new syllabus of the Examinations. The programmes containing the new regulations, which will come into force during the June Examinations, have been printed in full in the current volume of the JOURNAL, p. 237.

The Council desire to express their obligation to the Board of Examiners for their gratuitous services in conducting the Examinations.

The Royal Gold Medal for the promotion of architecture was awarded in 1897 to Dr. P. J. H. Cuypers (*Hon. Corr. M.*), of Amsterdam, for his executed works as an architect. Her Majesty has graciously signified her approval that it shall be awarded this year to the President, Professor George Aitchison, R.A., for his works as an architectural writer and for his executed works as an architect.

The Deed of Award of the various Prizes and Studentships was presented to the Institute at a General Meeting on the 24th January. A critical appreciation of the drawings submitted was read by Mr. Ernest George, *Vice-President*. An exhibition of the drawings was held in the rooms on the second floor, newly acquired by the Institute, from the 14th to the 24th January inclusive. The exhibition included the drawings made by Mr. Cecil Brewer, Pugin Student 1896; Mr. J. A. R. Inglis [*A.*], Soane Medallist 1897; Mr. W. Haywood, Pugin Student 1897; Mr. A. E. Henderson, Owen Jones Student 1897; Mr. A. T. Griffith, Aldwinckle Student 1897. The Deed of Award is printed in the JOURNAL, pp. 152, 153.

The following selection from the Institute prize drawings is now being sent round for exhibition at the various allied centres:—Drawings of Clare College, Cambridge, by Mr. Thomas Tyrwhitt (*Measured Drawings Medallist*), and of Thaxted Parish Church, by Mr. Cyril Wontner Smith (awarded a Medal of Merit in the Measured Drawings Competition); measured drawings and sketches by Mr. Charles De Gruchy (*Pugin Student*) and Mr. Benjamin Bower (awarded Medal of Merit and £5 5*s.* in the Pugin Competition);

designs for a villa and ornamental garden by Mr. John Stevens Lee (*Tite Prizeman*) and Mr. Thomas A. Pole (awarded Medal of Merit and £10 10*s.* in the Tite Competition); designs for a small country church by Mr. Harbottle Reed (*Grissell Medallist*) and Mr. W. Stanley Bates (awarded Medal of Merit in the Grissell Competition); measured drawings and sketches by Mr. James B. Fulton (*Aldwinckle Student*); Testimonies of Study for the Final Examination by Mr. Percy Morris and Mr. Laurence Hobson (*Cates Prizemen* 1897), and for the Intermediate by Mr. F. W. Newman and Mr. J. E. Franck.

With regard to the Owen Jones Studentship, the Council have to report that, the value of the Studentship having gradually increased to double its former value, and the will of the late Owen Jones giving them the authority to act, they have increased the value of the Studentship from £50 to £100, and the duration of the Student's tour from eight weeks to six months. They have also decided that, on his return from the tour, the Student shall submit an original composition in colour decoration on a prescribed subject.

On behalf of the Royal Institute and the Allied Societies the Council addressed their congratulations to Her Majesty the Queen on the attainment of the sixtieth year of her reign. The Address, signed by the Council and by the Presidents of the Allied Societies, was received graciously by Her Majesty.

A Festival Dinner was held on the 2nd December at the Whitehall Rooms to commemorate the sixtieth anniversary of Her Majesty's accession and the incorporation of the Royal Institute. The company included many distinguished guests, among whom may be mentioned the Bishop of London, the Lord Mayor, the Chairman of the London County Council, and the Presidents of the Royal Academy, the Royal Institute of Painters in Water Colours, the Institution of Civil Engineers, the Incorporated Law Society, and the Surveyors' Institution, Sir George Scott Robertson, K.C.S.I., and the Hon. Willoughby Burrell. Professor Aitchison, R.A., President of the Royal Institute, was in the chair.

The Council desire to announce that they have taken over from the Architectural Union Company the lease of the second floor of the premises in 9 Conduit Street, at the rent of £175 per annum, the lease to be coterminous with that of the premises already occupied by the Institute. Two rooms are sublet. Of the remaining three rooms, one will be used, for the present, as an office; another has been fitted with bookcases, to afford storage space for the Library, which has outgrown its present accommodation; while the third room, to the front, overlooking Conduit Street, is being fitted up as a tea and smoking room. It is hoped that this will be of great convenience to, and much used by, both metropolitan and provincial members. Arrangements will be made for tea and coffee to be supplied at moderate charges.

The Institute has received a large supply of programmes, maps, &c., from the Trustees of the Phœbe Hearst Architectural Plan for the University of California, and is distributing particulars to intending competitors.

The Report of the Council on the Fellowship question came before the General Body, and at a Special General Meeting, held on Monday, 14th June 1897, nine resolutions were passed, two of which necessitated a change in the By-laws.* At a Special General Meeting, held on Monday, 13th November, it was resolved that a change be made in By-law 30, by which the Council remain in office until the last General Meeting in June each year, instead of the first, as hitherto.†

The Council are pleased to report that they have been enabled since 31st December last to invest the sum of £148 in shares in the Architectural Union Company, and the sum of £974 11*s.* 7*d.* in 2¾ per cent. Consols.

At the Architectural Congress held at Brussels last year in connection with the International Exhibition the Institute was represented by the President and Mr. John Slater [*F.*].

* JOURNAL, Vol. IV. 3rd series, pp. 395, 396.

† JOURNAL, current vol. p. 112.

At the Triennial International Congress of Hygiene and Demography held in April this year at Madrid, Mr. Thomas W. Cutler [*F.*] was appointed to represent the Institute.

REPORT OF THE ART STANDING COMMITTEE.

The Art Standing Committee report that they have held six meetings since the publication of the last report. Mr. Alfred Waterhouse, R.A., was re-elected Chairman; Mr. Macvicar Anderson, Vice-Chairman; and Messrs. E. W. Mountford and Owen Fleming were reappointed Hon. Secretaries.

Vauxhall Bridge.—After some considerable amount of correspondence on this subject, Mr. Alfred Waterhouse and Mr. Mountford were favoured with an interview by Sir Alexander Binnie, who exhibited to them his drawings and a carefully prepared model of the bridge. Your Committee are gratified to find that the London County Council have abandoned their original proposal for a steel bridge, and have now determined to construct it of concrete faced with granite.* Your Committee are still in communication with the London County Council respecting the details of the masonry.

New Government Offices in Whitehall.—This subject has received much consideration from the Committee, and, with the consent of the Council, the President, Mr. Alfred Waterhouse and Mr. J. Macvicar Anderson attended before the Committee of the House of Commons to give evidence in favour of a scheme which embraced the widening of the north end of Whitehall westwards, and certain other modifications of the Government proposals for providing a site for the War Office and carrying out the improvement of Parliament Street. The Parliamentary Committee, while adopting some of the suggestions of your representatives, unfortunately appeared to think that the probable cost of the widening of Whitehall was an insuperable objection to this portion of the proposals. The Chairman of the Committee, however, warmly thanked your representatives for attending and for the trouble they had taken in the matter.

Liskeard Church Tower.—The proposed destruction of the western tower of this church has frequently been considered by your Committee, who, with the consent of the Council, have had some correspondence with the Local Authorities. The Faculty applied for was, in the first case, refused by the Chancellor of the Diocese, but quite recently he appears to have reconsidered his decision, and has consented to the old tower being taken down and replaced by a new one, on the condition that the materials of the old tower are to be re-used as far as possible in the construction of the new tower, and that the height is not to be increased by more than nine feet. This decision is much to be deplored.

Russell Square.—A letter respecting the alterations of the exterior of the houses in this square having been sent from the Council for the consideration of your Committee, a memorial in the form of a protest against the suggested disfigurement of the elevations was addressed to the Duke of Bedford, which was duly acknowledged by Mr. Alfred Stutfield. Your Committee greatly regret, however, to observe that the alterations are still being proceeded with.

Kew Bridge.—Your Committee having learned that the existing bridge is about to be removed and rebuilt from the designs of Sir J. Wolfe Barry, the Chairman, at the request of your Committee, has been in communication with that gentleman.

Sessional Papers.—Your Committee have to record that for the first time for some years no evening has been allotted to them for the reading of papers on subjects connected with Art before the Institute.

Your Committee have passed a cordial vote of thanks to the Chairman, Vice-Chairman, and Hon. Secretaries for their services during the Session.

* The advantages of stone construction over steel construction were strongly urged by the Deputation of your Committee at their interview with the Bridges Committee of the L.C.C. on 23rd May 1894.

REPORT OF THE LITERATURE STANDING COMMITTEE.

The Literature Standing Committee report that since the election of the Committee, on 14th June 1897, they have held seven meetings. At the first meeting of the Committee Mr. Alex. Graham, F.S.A., was appointed Chairman; Mr. R. Phenè Spiers, F.S.A., Vice-Chairman; and Messrs. R. Elsey Smith and Arthur S. Flower, M.A., Hon. Secretaries.

The appointment of a Librarian having been referred to the Committee by the Council, the matter was carefully considered, and the Committee made a recommendation to the Council that Mr. Rudolf Dircks, who had been acting as Librarian for six months, should be appointed to the post, and this recommendation was subsequently confirmed by the Council.

The following Sessional Papers arranged for by the Committee have been read:—"Notes on Renaissance Architecture in Malta, with special reference to the Buildings of the Order of St. John," by Mr. Arthur S. Flower [*A.*], M.A., F.S.A., on 15th November 1897; "The Housing of the Drama," by Mr. E. O. Sachs, on 7th February 1898; "The Mediæval Campanili of Rome," by Mr. J. Tavenor Perry [*F.*], on 21st February; "Heraldic Drawing and its Adaptation," by Mr. J. D. Crace [*H.A.*], on 21st March; "Artistic Copyright," by Mons. G. Harmand, on 4th April; and "Domestic Architecture in the United States," by Mr. A. N. Paterson [*A.*], M.A., on 18th April. The following paper has been arranged for a subsequent date:—"The Libraries of the Middle Ages," by Mr. T. G. Jackson, R.A., on 16th May.

The Committee desire to acknowledge their indebtedness to the authors of the several articles and reviews contributed to the JOURNAL during the past year, namely:—Prof. Aitchison, R.A., Messrs. T. W. Aldwinckle, R. S. Ayling, R. S. Balfour, A. T. Bolton, Cav. Giacomo Boni, Prof. G. Baldwin Brown, Messrs. P. Hippolyte-Boussac, Charles Buls, H. W. Burrows, Frank Caws, Somers Clarke, John Cotton, J. D. Crace, E. Guy Dawber, W. M. Fawcett, Owen Fleming, B. F. Fletcher, J. A. Gotch, Matt. Garbutt, E. W. Hudson, J. H. Jones, Prof. Kerr, Mr. H. V. Lanchester, Dr. A. S. Murray, Messrs. F. C. Penrose, F.R.S., W. A. Pite, Col. L. Prendergast, Messrs. W. Scott, W. Simpson, R.I., R. Phenè Spiers, A. E. Street, B. T. Taylor, C. Harrison Townsend, Paul Waterhouse, and A. M. Watson.

The Committee desire once more to express their satisfaction with the efficient and zealous assistance they have received in the conduct of the JOURNAL from the Sub-Editor, Mr. George Northover.

The Committee have arranged for a further economy in the publication of the JOURNAL by altering the date of publication from Thursday to Saturday, whereby the high charges for night work are avoided.

The Committee have had under consideration the need for a Supplement to the Brandon Catalogue of the Library, which was published in 1888, and made a recommendation to the Council to print a Supplement to the Catalogue of the Reference Library, bringing it up to date, which recommendation has been adopted.

During the past year an important addition to the Library accommodation has been made by the incorporation with the Library premises of three rooms in the upper floor, one of which is being fitted up with shelves. It is proposed to transfer to these rooms those books in the Library which are only very rarely consulted, and to provide in this manner the accommodation so urgently required for the Reference Library.

The Committee have also to report that, in order to avoid the risk of damage from moisture to the Burlington-Devonshire Collection, they have had an air-tight case made to hold the Collection.

The Committee have received from the Architectural Union Company a donation of £30 for the purchase of books, a portion of which has been already expended.

The Librarian reports to the Committee as follows:—

During the twelve months ending on the 31st March of the present year, 172 volumes and 60 pamphlets have been added to the Reference Library, exclusive of periodicals, reports, and transactions of Societies, and parts of works issued in serial form now in progress. During the same period 91 volumes and 4 pamphlets have been added to the Loan Library. These figures include the volumes which were received under the White Bequest, and which were not included in the statistics of my last report.

The purchases comprise 42 volumes and 3 pamphlets for the Reference, and 24 volumes for the Loan Library.

The attendances of borrowers and readers during the year numbered 3,716 (last year 3,042), the number of works issued on loan being 1,073 (last year 931; in 1896, 831). A table of attendances of readers using the Reference Library is herewith appended:—

Date	Day Attendances. 10 a.m. to 5 p.m.					Evening Attendances. 5 p.m. to 8 p.m.					
	Members.		Non-members.			Members.		Non-members.			
	Library.	Periodicals only.	Library.	Periodicals only.	Total.	Library.	Periodicals only.	Library.	Periodicals only.	Total.	Books issued on Loan.
1897.											
April	34	4	68	4	110	23	10	63	13	109	84
May	54	8	79	9	150	35	7	76	8	126	121
June	37	6	63	5	111	26	10	68	4	108	65
July	41	5	23	4	73	61	4	27	3	95	62
August	Vacation.					Vacation.					18
September	49	14	45	7	115	30	3	19	0	52	97
October	58	7	88	5	158	26	13	94	11	144	116
November	58	8	111	6	183	29	12	68	14	123	108
December	46	5	63	4	118	29	5	68	8	110	88
1898.											
January	63	14	79	13	169	43	4	42	2	91	108
February	63	18	75	8	164	26	6	42	7	81	101
March	76	11	55	2	144	37	7	61	4	109	105
Total	579	100	749	67	1495	365	81	628	74	1148	1073

Since the beginning of the present year an account has been kept of the number of volumes issued to readers using the Reference Library. This shows that 1,554 volumes were consulted from the 1st January to the 31st March 1898.

The number of tickets issued to other than members of the Institute, or to Students and Probationers, for admission to the use of both departments of the Library was 56.

Many valuable donations have been received during the year, including Böttiger and Lindegren's *Hedvig Eleonoras Drottningholm anteckningar till Slottets ældre Bygnadshistoria*, presented by Herr Agi Lindegren; *Baukunst der Renaissance: Entwürfe von Studirenden*, presented by Professor J. C. Raschdorff [*Hon. Corr. M.*], the editor; Wagner's *Einige Skizzen: Projecte und ausgeführte Bauwerke*, presented by the Author [*Hon. Corr. M.*]; Blomfield's *History of Renaissance Architecture in England*, presented by the Author; Sachs' *Modern Opera Houses and Theatres* (vol. ii.), presented by Mr. H. L. Florence; and Hudson's *Law of Building*, presented by Mr. Arthur Cates.

Amongst the numerous important works acquired by purchase during the year, the following may be mentioned:—D'Espouy's *Fragments d'Architecture du moyen âge et de la renaissance;* Paoletti di Osvaldo's *L'Architettura e la Scultura del Rinascimento in Venezia* (3 vols.); *Dessins inédits de Viollet Le Duc;* Roeper and Bösch's *Moebel aller Stilarten vom Ausgange des Mittelalters bis zum Ende des* 18. *Jahrhunderts;* Vallance's *Art of William Morris; Le mobilier national depuis Louis XIV jusqu'à l'Empire;* Westlake's *History of Design in Painted Glass;* Dehli's *Norman Monuments in Palermo;* Schmidt and Fabiana's *Vicenza;* Longfellow's *Cyclopedia of Architecture in Italy*, &c.

Many new and interesting books have been added to the Loan Collection, and several works have been purchased with a view to making the Library more complete in special subjects.

REPORT OF THE PRACTICE STANDING COMMITTEE.

The Practice Standing Committee report that they have held the usual monthly meetings, Mr. J. Douglass Mathews having been elected Chairman; Mr. Thomas Harris, Vice-Chairman; and Messrs. Edmund Woodthorpe [*F.*] and C. H. Brodie [*A.*], Hon. Secretaries.

The amended Schedule of Professional Charges occupied the attention of the Committee until 21st December, when its consideration was completed, and it was sent, with a report, to the Council, who now have it under consideration, assisted by the Chairman and Vice-Chairman of the Committee.

The question of the stamping of awards, where no amount is stated, received the attention of the Committee, and a decision obtained by the Committee from the authorities at Somerset House was published in the JOURNAL of 26th February last.

An important question as to the construction of clauses 17, 20, and 25 of the new Conditions of Contract was referred to and is being considered by the Committee.

The attention of the Council was called to the liability of architects, when doing certain works, to obtain licenses as appraisers. This matter was referred to the Committee, and is still under consideration.

The Council referred to the Committee the Draft Bill of the London County Council for amending the London Building Act 1894, together with an explanatory letter thereon; also a large number of letters received in answer to the circular sent to members requesting opinions as to the general amendments that the Act needs. As the Bill was already before Parliament it was decided to confine the attention of the Committee for the moment to the consideration of the points raised by the Draft Bill. This was considered in detail and a report thereon sent to the Council.

The Bristol Society of Architects forwarded a copy of a resolution of the District Federation of Builders suggesting that risks under the Employers' Liability Act should be insured against, and the amount placed in the contract and paid by the employer. This was referred by the Council to the Committee, who reported that, as the Institute Conditions of Contract provide for the contractor taking all risks of injury to persons, &c., it was in their opinion most undesirable to interfere with this or to create a divided responsibility.

REPORT OF THE SCIENCE STANDING COMMITTEE.

The Science Standing Committee report that during the past Session they have held several meetings, with an average attendance of 11 members. Mr. P. Gordon Smith was appointed Chairman; Professor Unwin, F.R.S., Vice-Chairman; and Mr. William C. Street and Mr. H. D. Searles Wood, Hon. Secretaries.

A further report on the Results of Experiments for the purpose of ascertaining the strength of different kinds of brickwork was presented to the Institute at the Ordinary Meeting held on 13th December.*

The Committee have presented a report to Council on the subject of standardizing the size of bricks, referred to the Committee by a General Meeting of the Institute on the 1st March 1897, and are now in communication with the Brickmakers' Association with the object of coming to an agreement on the matter.

The subject of proposed Building Regulations for the purpose of reducing the liability of warehouses, &c., to destruction by fire has occupied the attention of the Committee for several meetings, but no conclusions have yet been arrived at.

FINANCES.

The accounts of Ordinary Funds for 1897, prepared by Messrs. Saffery Sons, & Co., chartered accountants, and audited by Mr. Edmund Woodthorpe [*F.*] and Mr. Owen Fleming [*A.*], the Hon. Auditors appointed at the Annual General Meeting of 1897, here follow:—

* The question of publishing an account of the whole of the experiments and results in octavo form is being referred to the Council for their decision.

Income and Expenditure Account of Ordinary Funds for the Year ended 31st December 1897.

Dr. Exclusive of Entrance Fees and Final Examination Fees; and Subscriptions received in advance for 1898. **Cr.**

EXPENDITURE.

To Ordinary Expenditure—	£	s.	d.	£	s.	d.
Rent	760	0	0			
Gas and Electric Lighting	78	0	1			
Coals	17	8	0			
				855	8	1
Salaries				1037	12	0
General Printing, Stationery, Stamps, Petty Expenses				406	13	6
Expenses of General Meetings, Exhibitions, &c.				185	2	9
Housekeeping (including Office Attendant)				114	4	1
Advertisements in Newspapers				42	14	0
Examination Expenses				233	0	1
General Repairs				30	5	6
Fire Insurance				20	4	6
Medals and other Prizes				90	4	0
Grant to Library				100	0	0
Grant to Architectural Association				100	0	0
The Journal—						
Reporting	58	16	0			
Printing and Binding	682	9	4			
Illustrations	134	18	3			
Addressing, Posting, and Carriage	211	7	4			
				1087	10	11
The Kalendar—						
Printing	146	3	7			
Postage and Carriage	8	4	3			
				154	7	10
Contributions to Allied Societies				251	10	0
Miscellaneous Expenses—						
Furniture bought	1	10	0			
Legal Expenses and Accountants' Charges	51	16	11			
Honorarium* Asst. Secretary... £100 0 0						
Do. Sub-Editor 50 0 0						
Do. Clerk 25 0 0						
	175	0	0			
Jubilee Celebration	48	18	0			
Donation to Leighton Memorial Fund	10	10	0			
Contribution to Grissell Fund	21	13	3			
Festival Dinner	24	2	0			
Sundries	30	2	0			
				363	12	2
				5072	9	5
Balance of income over expenditure				1116	11	1
				£6189	0	6

INCOME.

By Ordinary Income—	£	s.	d.	£	s.	d.
Subscriptions—						
554 Fellows	2326	16	0			
Ditto, Arrears	71	8	0			
Arrears of Fellow reinstated	29	8	0			
905 Associates	1900	10	0			
1 ditto on account	1	1	0			
Ditto, Arrears	88	4	0			
Arrears of Associates reinstated	23	2	0			
51 Hon. Associates	107	2	0			
				4547	11	0
Dividends on Stocks and Shares—						
Architectural Union Co.	121	0	0			
Consols	26	11	8			
Tasmanian Government Stock	8	9	6			
Interest on Deposit	14	19	7			
				171	0	9
Sale of Publications (other than Journal and Kalendar)				152	19	6
Use of Rooms—						
District Surveyors' Association	25	0	0			
Architectural Association	6	10	0			
				31	10	0
Examination Fees—						
Statutory	2	2	0			
Preliminary	427	7	0			
Intermediate	218	8	0			
Final (extra)	22	1	0			
				669	18	0
Journal and Kalendar—						
Advertisements	530	0	0			
Sales	59	16	3			
				589	16	3
Rents due Christmas 1897				26	5	0
				£6189	0	6

* For services during illness of late Secretary, and until the appointment of his successor.

Dr. *Balance Sheet of Ordinary Funds, 31st December* 1897. **Cr.**

LIABILITIES.

	£	s.	d.	£	s.	d.
To Sundry Creditors outstanding				191	15	1
To Examinations: Fees anticipatory of election				66	3	0
To Subscriptions for 1898 received in advance				87	3	0
To *Accumulated Funds* [being balance of Assets over Liabilities]—						
Surplus Liquid Assets over Liabilities as per last Balance Sheet	4298	13	10			
Add Legacies, viz.:—David Brandon	1000	0	0			
David Mocatta	100	0	0			
Entrance Fees £133 7 0						
Examination Fees forfeited 28 7 0						
	161	14	0			
Arrears for 1897 (as per contra)	297	3	0			
	5857	10	10			
Less Arrears included in 1896 account since received or cancelled	210	0	0			
	5647	10	10			
Balance of Income over Expenditure in 1897	1116	11	1			
				6764	1	11
Saffery, Sons, & Co., Chartered Accountants.				£7109	3	0

ASSETS.

	£	s.	d.	£	s.	d.
By Cash at Bank				1568	17	8
By Investments*:—						
Architectural Union Co., 252 Shares	3494	11	0			
£1000 2¾ per Cent. Consols	925	9	6			
£501 2*s.* 9*d.* 3½ per Cent. Tasmanian Government Stock	550	0	0			
				4970	0	6
By Debtors				176	9	10
By Subscriptions in Arrear 1895–96	96	12	0			
Ditto 1897	297	3	0			
				393	15	0
				£7109	3	0

* *Total of Investments as above* £4970 0 6
Ditto in 1896 ..... 3753 9 6
Additions in 1897 ... £1216 11 0

Examined with the several vouchers and found to be correct. 31*st March* 1898. (Signed) { Edmund Woodthorpe. Owen Fleming.

The Revenue Account and Balance Sheet of Trust Funds for the year 1897, audited by Mr. Edmund Woodthorpe [*F.*] and Mr. Owen Fleming [*A.*], here follow:—

Revenue Account of Trust Funds for the Year ended 31st December 1897.

Dr.

	£	s.	d.
Aldwinckle Studentships:—			
To Cash paid Student 1896 [H. S. East]	50	0	0
To Cash paid Student 1897, 1st instalment [A. T. Griffith]	25	0	0
To Balance carried forward	75	0	0
	150	0	0
Ashpitel Prize Fund:—			
To Cost of Books for Prizeman [T. Denton Brooks]	10	10	0
To Balance carried forward	10	7	0
	20	17	0
Charitable Fund:—			
To Cash paid Architects' Benevolent Society	5	5	0
To Balance carried forward	0	18	4
	6	3	4
Donaldson Testimonial Fund:—			
To Cost of Medals	2	15	0
To Balance carried forward	0	10	0
	3	5	0
Godwin Bursary:—			
To Cash paid Bursar 1895, 2nd instalment [A. W. Cleaver]	20	0	0
To Cash paid Bursar 1896, 2nd instalment [A. N. Paterson]	20	0	0
To Cash paid Bursar 1897, 1st instalment [R. S. Ayling]	20	0	0
To Cost of Medals	3	19	0
To Balance carried forward	13	15	11
	77	14	11
Grissell Legacy:—			
To Balance from last Account	17	11	6
To Cash paid Prizeman [S. K. Greenslade]	10	10	0
To Cost of Medal	9	18	0
	37	19	6
Library Fund:—			
To Purchase of Books, Binding, &c.	73	18	6
To Printing, Stationery, &c.	3	15	6
To Petty Expenses	2	1	7
To Balance carried forward	36	6	9
	119	0	9
Owen Jones Studentship:—			
To Cash paid Student 1896, 2nd instalment [H. C. Corlette]	25	0	0
To Cash paid Student 1897, 1st instalment [A. E. Henderson]	25	0	0
To Balance carried forward	53	1	4
	103	1	4
Pugin Memorial Fund:—			
To Cash paid Student 1896 [C. C. Brewer]	40	0	0
To Balance carried forward	13	17	10
	53	17	10
Tite Legacy Fund:—			
To Balance from last Account	3	15	6
To Cash paid Prizeman 1896, Balance of Grant [H. A. Crouch]	10	0	0
To Balance carried forward	16	15	10
	30	11	4
Travelling Fund:—			
To Cost of £40 Madras Railway 4½ per Cent. Stock	61	4	0
To Balance carried forward	5	7	0
	66	11	0

Cr.

	£	s.	d.
By Balance from last Account	150	0	0
	150	0	0
By Balance from last Account	10	17	0
By Dividend on 20 Shares, Architectural Union Co., at 10s. per share	10	0	0
	20	17	0
By Balance from last Account	0	16	8
By Dividends on £200. 10s. 2¾ per Cent. Consols	5	6	8
	6	3	4
By Balance from last Account	0	9	6
By Dividends on £72 L. & N.W. Railway 4 per Cent. Preference Stock	2	15	6
	3	5	0
By Balance from last Account	37	18	5
By Dividends on £1030 Caledonian Railway 4 per Cent. Debenture Stock	39	16	6
	77	14	11
By Dividends on £300 Great Indian Peninsula Railway 5 per Cent. Stock	16	6	3
By Cash from Ordinary Funds to liquidate deficit	21	13	3
	37	19	6
By Balance from last Account	2	14	4
By Annual Donation from Mr. Sydney Smirke	5	0	0
By Entrance Donations of three Hon. Associates	6	6	0
By Grant from Ordinary Funds	100	0	0
By Fines (Loan Collection)	2	2	0
	119	0	9
By Balance brought forward	10	11	2
By Dividends on £1773. 6*s.* 8*d.* Midland Railway 3 per Cent. Debenture Stock	51	8	6
By Dividends on £850 Great Western Railway 5 per Cent. Consolidated Stock	41	1	8
	103	1	4
By Balance from last Account	12	10	4
By Dividends on £1070 L. & N.W. Railway 4 per Cent. Preference Stock	41	7	6
	53	17	10
By Dividends on £1150 2¾ per Cent. Consols	30	11	4
	30	11	4
By Balance from last Account	29	11	7
By Dividends on £830 Madras Railway 4½ per Cent. Stock	36	2	0
By Dividends on £10 „ „ „ „	0	17	5
	66	11	0

Examined with the several vouchers and found to be correct. 31*st March* 1898. (Signed) { Edmund Woodthorpe. / Owen Fleming.

Balance Sheet of Trust Funds, 31st December 1897.

Dr.	£	s.	d.	Cr.	£	s.	d.
To Ashpitel Prize Fund:—				By Government and other Securities for total value of Trust Funds invested	9704	0	1
Capital—20 Shares in the Architectural Union Company, Limited, at £14 per Share	280	0	0	By Cash in hands of Bankers	226	9	6
Balance at credit of Revenue Account	10	7	0				
To Charitable Fund:—							
Capital—£200, 10*s.* 2¾ per Cent. Consols	195	14	9				
Balance at credit of Revenue Account	0	18	4				
To Donaldson Testimonial Fund:—							
Capital—£72 L. & N.W. Railway 4 per Cent. Preference Stock	89	0	0				
Balance at credit of Revenue Account	0	10	0				
To Godwin Bursary:—							
Capital—£1030 Caledonian Railway 4 per Cent. Debenture Stock	1314	13	6				
Balance at credit of Revenue Account	13	15	11				
To Grissell Legacy Fund:—							
Capital—£300 Great Indian Peninsula Railway 5 per Cent. Guaranteed Stock	513	14	10				
To Library Fund:—							
Balance at credit of Revenue Account	36	6	9				
To Owen Jones Studentship:—							
Capital—£1773, 6*s.* 8*d.* Midland Railway 3 per Cent. Debenture Stock (£ 1773 0 0)							
£1100 Great Western Railway 5 per Cent. Consolidated Stock (1900 12 0)							
Balance at credit of Revenue Account (53 1 4)							
	3234	3	2				
To Pugin Memorial Fund:—							
Capital—£1070 L. & N.W. Railway 4 per Cent. Preference Stock	1342	12	6				
Balance at credit of Revenue Account	13	17	10				
To Tite Legacy Fund:—							
Capital—£1150 2¾ per Cent. Consols	1109	1	6				
Balance at credit of Revenue Account	16	15	10				
To Travelling Fund:—							
Capital—£870 Madras Railway 4 per Cent. Stock	1155	11	0				
Balance at credit of Revenue Account	5	7	0				
To Aldwinckle Studentships Fund:—							
Balance at credit of Revenue Account	75	0	0				
	£9930	0	1		£9930	0	1

Examined with the several vouchers and found to be correct. 31*st March* 1898. (Signed) { Edmund Woodthorpe. Owen Fleming.

Note.—In accordance with a recommendation by the Finance Committee adopted by the Council in June last, the liquid assets only have been included in the Balance Sheet of Ordinary Funds [p. 40], the values put upon the furniture and other property being omitted. These are shown in the subjoined "Schedule of Property."

Schedule of Property.

	£	s.	d.	£	s.	d.
Furniture, Fittings, &c., as per last Balance Sheet	2496	12	4			
Additions during year 1897	1	10	0			
	2498	2	4			
Less Depreciation	62	9	0			
				2435	13	4
Printed Books and Manuscripts				4000	0	0
Oil Paintings				1800	0	0
Lithographs, Prints, &c.				400	0	0
Water-colour, Sepia, &c.				600	0	0
Models, Plaster Busts, &c.				140	0	0
Marble Busts				150	0	0
				£9925	13	4

In conclusion the Council submit an Estimate of Income and Expenditure of Ordinary Funds for the twelve months of 1898, exclusive of Entrance and Final Examination Fees:—

Expenditure.	£	s.	d.	Income.	£	s.	d.
Rent, Lighting, and Warming	1060	0	0	Subscriptions and Arrears	4570	0	0
Salaries	1225	0	0	Dividends on Stocks and Shares and Interest on Deposit Account	195	0	0
General Printing, Stationery, Postage, and Petty Expenses	435	0	0	Sale of Publications (other than Journal and Kalendar)	150	0	0
General Meetings, Exhibitions, &c.	180	0	0	Journal and Kalendar—	£	s.	d.
Housekeeping (including Office Attendant, &c.)	135	0	0	Sales	60	0	0
Advertisements	45	0	0	Advertisements	530	0	0
Examination Expenses (Statutory and Institute)	250	0	0			590	0	0
General Repairs	120	0	0	Use of Rooms		85	0	0
Fire Insurance	25	0	0	Examination Fees—	£	s.	d.	
Medals and other Prizes	85	0	0	Statutory	10	0	0	
Library Grant	100	0	0	Preliminary	450	0	0	
Architectural Association Grant	100	0	0	Intermediate	220	0	0	
Journal (2,250 copies): Reporting, Printing, Binding, Carriage, &c.	1000	0	0	Final (Extra Fees)	25	0	0	
Kalendar (2,500 copies)	150	0	0			705	0	0
Contributions to Allied Societies	260	0	0					
Legal and other expenses	50	0	0					
Miscellaneous Expenses	75	0	0					
	£5295	0	0					
Estimated Balance	1000	0	0					
	£6295	0	0		£6295	0	0	

THE WARMING OF PUBLIC BUILDINGS.*

By FREDERIC R. FARROW [*F.*], *Godwin Bursar* 1884.

IT is a matter of considerable importance under existing conditions, that architects should make themselves masters of the elementary principles and leading points in the practice of the warming of Public Buildings. It must be the experience of many that of the number of tradesmen who style themselves Heating and Ventilating Engineers, by far the large majority are densely ignorant of the most elementary facts bearing upon the work they are so eager to undertake, whilst a still larger majority are nothing more than middlemen, whose object is, by persistent advertising and push, to induce us to recommend our clients to purchase the goods they sell. The hardware trade generally, and especially that section of it which deals in all varieties of hardware necessary in the construction and fitting up of buildings, is represented by men who are no more than tradesmen or commission agents. A great majority of the self-styled heating and ventilating engineers neither make nor understand what they sell, and, trusting in a somewhat general deficiency of scientific knowledge in the architectural profession, they succeed by the employment of agents, clad in good coats and hats and gifted with fluent tongues, in persuading architects to swallow the most absurd statements and entrust them with important work. It is therefore our duty to endeavour to attain to some knowledge of the rudimentary principles and facts connected with the warming of public buildings, in order that we may be able to detect and boycott the quack and impostor, and entrust our clients' interests to men who are qualified by some amount of scientific knowledge to carry out the work we give them. But even in dealing with qualified and genuine heating engineers, it is very desirable that we should ourselves know something of the subject, as these gentlemen are apt to regard a building simply as a shell in which they can install their apparatus, and are quite oblivious of the claims of our artistic work to recognition. If we know something of the scientific principles and practical requirements of heating apparatus we can meet the makers with a firm front, and insist upon ducts, boilers, gratings, pipes, and other paraphernalia of the warming engineer, being placed where we want them, and not where it may seem good to the engineer to place them. We can, in short, be, as we ought to be, the masters of our buildings, and not the slaves of the increasing army of specialists with which modern science and modern engineering are ever too ready to invade the domain of the architect and spoil his work as an artist.

* A lecture delivered before the Sheffield Society of Architects and Surveyors on 14th December 1897.

Under the term public buildings we may include all those in which a considerable number of people may be gathered together in one or more apartments; where the majority of those who use the building have no direct influence or control in its management; where, in short, their presence is only temporary occupation and not permanent residence. Thus the class of public buildings include churches, theatres, concert halls, and other places of assembly. It includes schools, hospitals, municipal offices, and other places for public business, buildings for the amusement, the instruction, and the sanitary benefit of the public.

The subject, it will be evident, is one of considerable complexity, inasmuch as at the outset there are a large variety of structures which can be and are properly classed under the term "public buildings," but which differ in many essentials. So that it is not possible to lay down any hard and fast rule as to the best system to be adopted in the warming of public buildings. Indeed, it may be said that in every case there are peculiar circumstances requiring peculiar treatment, as much as in any other department of our work as architects. We all know by our common every-day experience that it is the rarest possible occurrence for the plans or arrangements of any one building to be exactly applicable to another instance, and capable of being duplicated. I therefore propose to start from the basis of various means and methods suitable and applicable for the warming of public buildings; and in the course of our consideration of these means and methods we shall find that, in general terms, some are more suited to one class of building and some to another.

HOT AIR HEATING.

In the warming of public buildings it may be taken as an axiom that open fires are inadmissible, as a general rule, owing to the small distances to which heat can be economically transmitted by this means. The methods, therefore, which remain are, hot air, water or steam; these latter being used under methods most commonly described as low pressure and high pressure. The warming of buildings by means of currents of hot air is one of considerable antiquity, and still meets with favour where expense is of primary importance, as it certainly has a very considerable advantage in economy in first cost. In the cheapest systems the method is to heat the air by some description of calorigen or stove, from which the hot air passes into the building, and, after traversing the apartments to be warmed, is again brought back by return channels to the calorigen and re-heated. Such a method at once stands self-condemned in the opinion of all who value

the health of those whom they are trying to warm; it need scarcely, therefore, be further considered.

An improvement on this method, although still open to objections on sanitary grounds, is the provision of a fresh supply of air to the calorigen, which, after being warmed, passes into the building and is carried away by whatever means of ventilation may be adopted. The objections to which this system is open are, that if the hot air has to pass through any considerable length of duct from the calorigen to the apartment to be warmed, there is a very serious loss of heat during the passage, and to compensate for this there is a general tendency to keep the surfaces of the calorigen at a sufficiently high temperature to raise that of the stream of fresh air to a high point to compensate for the loss. Now, in order that any apparatus or system of warming may be healthy, it is a cardinal point that the air must at no time be overheated or, in popular language, scorched. The evil effect of bringing air in contact with overheated surfaces, and thus scorching it, is of a complex character. It is frequently deprived of part of its oxygen by contact with the heated surface; it is almost always deprived unduly of its moisture, and what is probably most injurious, the minute and invisible particles of solid matter, largely organic, which ordinary atmosphere contains, are literally scorched and the air thereby vitiated. For a hot air system, therefore, to have a reasonable chance of being healthy in action, it is absolutely essential that the calorigen shall have a large heated surface of only a very moderate temperature. It is scarcely going too far to say that no calorigen whose heating surfaces in contact with the air are made of metal is desirable, certainly none in which those surfaces are of cast iron, can be regarded as absolutely unobjectionable from the point of view of hygiene. It goes without saying that any defect in the entirety of the calorigens greatly intensifies their evil effect, and calorigens of cast iron are peculiarly prone to lose their integrity. Hot air heating, therefore, can only be regarded as permissible where the heating apparatus can be placed in close proximity to the room to be warmed, and where an ample extent of heating surface at a moderate temperature can be arranged. Such systems are accordingly limited to a very small range of subjects.

The permissible maximum surface temperature at which a calorigen should work may be taken at 300° F., and the air should pass over such surface with sufficient velocity to prevent it being raised to a higher temperature than 120° F. at the moment of leaving the heated surface, and 60° F. at its entry into the room.

In America this system is largely used for warming domestic buildings, and in this country it has been employed to a considerable extent for warming churches and chapels. Although the first cost of such apparatus may be less than that of other methods, our clients should be warned that in maintenance it is more expensive.

HOT WATER.

The warming of buildings by means of systems in which water is made use of for the transmission of heat from the generating point to the point of application, will next engage our attention. These systems are classed broadly under the general terms of low pressure and high pressure, the essential difference between the two being that in low pressure systems a large body of water is kept in circulation at a moderate temperature; and in high pressure systems a small body of water is kept in more active and rapid circulation at a high temperature. The terms "low pressure" and "high pressure" are not altogether accurate, as there frequently occur cases in the use of low pressure systems in which very considerable pressure exists, in part, at any rate, of the apparatus. It is therefore generally understood that by low pressure systems is meant those in which warm water is employed, and by high pressure systems those in which hot water is employed; but although it has been suggested that the terms warm water and hot water should distinguish the two classes, it is hardly necessary to make the change, as the meaning of the terms low pressure and high pressure is well understood.

LOW PRESSURE.

In low pressure, or warm water, systems the arrangement consists of a boiler and its furnace, from which proceed one or more lines of pipes to the highest point of the system, where it is open to the air, and from which the water returns along the desired course back to the boiler. As a result of the system being open to the air at its highest point, the water can never be raised to a higher temperature than boiling point (212°) and, as a matter of fact, generally does not exceed 150° F. Still, even without being allowed to rise to its maximum temperature, a considerable loss occurs by evaporation, and some means of supplying the waste must be provided. In some cases this is done by pouring in water by hand, in others by an automatic feed cistern with ball valve. It ought, however, to be borne in mind that even with an automatic filling arrangement regular and periodic inspection ought to be given, as we all know that ball valves cannot be entirely trusted. It is not absolutely necessary, although I consider it desirable, that the connection between the system of piping and the supply cistern should be of the full diameter of the circulating pipes—1 in. or 1½ in. connection is sufficient. In the arrangement of the supply system provision must, of course, be made for the expansion of the water on being heated. The amount of expansion which

should be allowed for an increase of temperature from 40° F. to boiling point is 4·66, or nearly 5 per cent., and this expansion must be provided for, whether the filling is automatic or otherwise. The pipes used for low pressure or warm water systems are generally either 4-inch cast-iron pipes or 3-inch wrought-iron pipes, and there is not very much to be said in favour of one over the other. The cast-iron pipes are generally somewhat cheaper, and slightly more effective—surface for surface—in the radiation of heat (the radiation from new wrought-iron surfaces being 93 per cent. of that from new cast-iron) but it is more difficult to make satisfactory joints, and from their larger size they are more unsightly. When radiators are employed for the diffusion of the heat the pipes may be of smaller diameter—1½ in. or 2 in. at the most being sufficient, except in very large installations.

In the arrangement of lines of piping in low pressure systems it is desirable that the ascending column of warm water should rise as directly as possible to the highest point, and that from this point there should be a regular, even, steady gradient of descent back to the boiler. It is possible to use to a limited extent what are known as dips in the gradient of the pipes: that is, to allow the pipe to drop, in order to pass an obstruction, such as a door-opening, and then rise again to somewhere near its former level. This practice, however, must be used with the greatest caution, to an extent which is regulated by the difference in the weight of the ascending and descending columns of water. This weight, of course, depends upon, first, the height of the column; and, secondly, the temperature. Wherever dips are used air cocks must be provided, and it is desirable to introduce them also at intervals in the line of piping, principally at the points where bends occur. Nothing is more alarming to the occupants of a building than the series of small explosions which appear to be taking place in some systems of hot water pipes. This is almost in all cases due to the presence of air in the pipes. One point about bends and angles, which makes for superior efficiency, is increase of radius. The standard elbow has a radius = depth of pipe + ½ in. This is small, and may well be twice or three times as much. The question of joints in low pressure warm water systems, especially of cast-iron, is a matter of some difficulty. It must be taken as a never-to-be-forgotten axiom that warm water pipes when in use are always on the move; during the rise of temperature expansion is taking place; during the fall of temperature contraction. The desideratum, which can scarcely as yet be said to have been reached, is a joint which is absolutely water-tight under all conditions, and nevertheless allows of expansion and contraction without impairing its efficiency. The oldest and simplest form of joint is that known as the rust joint, formed by filling up the spaces between the spigot and socket with a mixture of iron filings and sal ammoniac. I fancy that modern craftsmen have largely lost the secret of making these joints; it clearly needs care and skill, as, in rusting, as we all know, iron expands considerably, and nowadays rust joints very frequently expand to such a degree as to split the sockets of the pipes. If properly made it is an effective but rigid joint, and when once set it is absolutely impossible to separate the pipes without breaking them. A modern substitute is Portland cement, but this is to be recommended only where the variation in the temperature of the pipes is moderate, as anything like a large amount of expansion and contraction quickly destroys the watertight properties of the joint. This also is a joint which, once made, is rigid, and does not admit of expansion and contraction. A fairly reliable joint can be made with tow and red and white lead. We then come to the class of movable or expanding joints. These are of varied forms. In principle they may be divided into two classes, those rigidly attached to the end of one pipe, allowing the other to move backwards and forwards; and those which allow, or are supposed to allow, both pipe-ends to move within the joint. The latter need careful and periodical examination, as one can never be sure that, on contraction taking place after expansion, the relative position of pipes and joints is maintained. As these joints almost invariably depend upon an indiarubber ring or flange for their watertight qualities, it goes without saying that their life is limited, as the durability of indiarubber, under such circumstances, is of no very great persistence. After experiencing a considerable amount of worry in the failure of so-called expansion joints, I have come to the conclusion that whenever there is anything like a considerable pressure, or head of water, say more than 15 feet, the most satisfactory arrangement is to use flange joints with copper expansion tubes in each long length. If wrought-iron pipes are used it is possible to allow for expansion and contraction by means of screw joints, and this is one point in favour of wrought-iron pipes. In supporting the pipes the principles to which I have already alluded must not be forgotten, and the brackets or clips which are used for such support must therefore permit of continual movement.

As the question of boilers concerns also the methods of steam heating, I will, with your permission, leave its consideration until I have given some account of the remaining systems.

The valves used in low pressure heating for the purpose of stopping off the current from part of the circulation system are usually one of three kinds—throttle, globe, and gate or slide valves. Of these the first is the cheapest, but not to be relied on for completely closing the flow; the

second answers well for steam heating, but offers too much obstruction to be entirely satisfactory for hot water; whilst the third is the most expensive, but the most trustworthy.

The advantages of the low pressure or warm water system of heating are that the pipes are kept at a moderate temperature, so that there is no chance of scorching the air or producing the risk of fire; the heat is maintained in the pipes for a considerable time after the fire has been allowed to die out; and the cast-iron pipe surfaces are slightly more effective in radiating heat than wrought iron. It also has more apparent safety than the high pressure system. I say apparent safety, because, although instances have occurred of explosions during testing, I believe that the high pressure system, when properly constructed, is quite as safe. And when failure does take place, it usually occurs—in the case of low pressure systems—in the pipes or joints, which, on breaking, cause considerable damage by allowing a large amount of water to flow out into the apartment, and cause considerable alarm by the amount of steam—or, rather, vesiculated water vapour—which passes off from the hot water. Failure in the high pressure systems, on the other hand, occurs usually in that portion of the piping coiled round the furnace, where damage from the water is not liable to be serious, and is also less in extent by reason of the much smaller body of water which the small pipes contain. The disadvantages of the low pressure system are, that the apparatus takes longer to get into full working order; the pipes are larger and more unsightly; the system requires for its successful working a straightforward arrangement of the pipes, and is not readily adapted to an intricate or involved plan.

The low pressure system, therefore, is best adapted for buildings of comparatively simple arrangement, and where the use of the building or apartment to be warmed and the consequent maintenance of the temperature is required to be continuous. It is, accordingly, almost invariably employed for heating greenhouses and conservatories, and is suitable for use in schools and other buildings similarly occupied.

HIGH PRESSURE.

In the high pressure or hot water system the general arrangements differ in almost every detail from those of low pressure. In the older—and still, in my opinion, most successful—method of using a high pressure system the arrangement consists of a circuit of small, strong wrought-iron piping, part of which, generally about one-sixth of the whole length of the piping, is coiled round the furnace, and at the highest point of the system a large, strong, cast-iron closed tube is fitted. This is called the expansion tube, and when the apparatus is cold it is practically empty of water. The whole system is hermetically sealed, so that when the water is heated by the furnace its consequent expansion causes a compression of the air in the expansion tube, and this compressed air, by its reflex pressure on the water, prevents it f om passing into steam. It can therefore attain a higher temperature than 212° F.

Partly owing to this high temperature of the water, partly from the pressure of the air in the expansion tube, and partly also from the small body of water contained in the whole system, a very rapid circulation is set up and maintained.

The pipes are usually $\frac{7}{8}$ to 1 inch bore, and about $\frac{1}{4}$ inch metal; and it is the usual practice to test each apparatus up to at least 1,000 lbs. pressure on the square inch, and I have seen them tested as high as 3,000 lbs. The joints are made in a very simple and effective manner. The end of one pipe has a smooth, flat end, and the adjacent end of the next pipe has a chiselled edge. These are drawn together by a collar with right and left hand screw, so that a very perfect and satisfactory joint is produced.

The actual conditions under which these systems work is not very completely understood, but, generally, from observations that have been made, it is safe to assume that the working pressure in the pipes ranges from 300 to 500 lbs. on the square inch, and the average temperature of the pipes may be taken at 250° to 350° F. The idea of the enormous pressure within the pipes is rather alarming; and, although I am quite convinced that there is no great probability of a dangerous explosion, still efforts have been made to minimise the pressure by the provision of a feed cistern, with a valve arranged to open when the pressure in the pipes rises to the specified figure, and a reflex valve to allow the water to return when the pressure falls. My personal experience of these feed cisterns and valves has been eminently unsatisfactory. The supposition and intention is that the valve will be opened at a pressure of, say, 400 lbs., and relieve the pipes, and, when the pressure is removed, will open the reverse way, and feed the pipes with water. We all know that valves are constantly liable to much derangement, and I have found that with these feed cisterns, although the pressure is relieved, the return of the water does not occur, so that, after a very short space of time, the water in the pipes is all boiled away, and then those round the furnace are, of course, quickly burnt through. I should therefore certainly advise that the older arrangement with expansion tubes should be preferred. Of course, like all engineering work, this apparatus has a limited life. What that limit may be depends upon circumstances. The shortest life which I have met in my experience is twelve years, with a heating apparatus in a church,

where it is not used more than two days a week during the winter months. When failure does take place, it occurs in the portion of the piping coiled around the furnace. It is not usually a dangerous explosion; one or more pipes crack, the water rushes out into the furnace, puts out the fire, and makes a great steam and smoke, which, though unpleasant and alarming, is not dangerous; and I have seen quite as alarming an effect produced with low pressure apparatus on a pipe cracking at the joints during use.

The advantages of the high pressure, or hot water, system are, first, that the apparatus is more quickly raised to its maximum point and efficiency; secondly, the pipes, being small, are less of a disfigurement, and thirdly—the most important of all—the system admits of considerable latitude in arrangement of dips, and departures from a straightforward line of piping. On the other hand, the heat in the pipes is not long maintained when the furnace is allowed to cool down; the pipes, from their high temperature, are somewhat liable to scorch the air in contact with them, and there is a greater possibility of danger from fire unless the pipes are carefully isolated from woodwork and other inflammable material. Although the pipes never rise to anything like a red heat, still continued exposure to the temperature at which they work may, and has, caused inflammable material, first of all to char, and afterwards to ignite. As regards cost, everything depends upon the conditions of each particular case. In one instance, low pressure may be cheaper to install, in another, high pressure; but, speaking in general terms, on a fair average of buildings suited to each, I think it may be accepted that low pressure systems are more expensive in first cost, and high pressure systems more expensive in maintenance.

The high pressure system, then, is particularly applicable to buildings which are to be used at intervals, as it admits of the maximum heating power being rapidly attained; but, on the other hand, it does not retain its heat for any lengthened period. It is also useful where the arrangement of the piping must necessarily be subject to a considerable amount of variation from the straightforward line. The high pressure system has been and may readily be, freed from one of its greatest defects by using the high pressure hot-water pipes simply as a means of carrying heat to the point of application, and there employing it to warm a larger body of water by which the actual diffusion of the heat is to be performed. In this respect it is on a par with steam heating, which can be and has been applied in a similar way. This diffusion of the heat, of which I have been speaking, can of course be arranged in various ways. A secondary heater, somewhat in the form of a small boiler, can be employed, from which a circulation on a low pressure system can be arranged, or the secondary heater itself may furnish the surface from which the heat is to be diffused. A very good arrangement of this sort, which I once saw, was contrived with a large size copper tank, in the form of a hollow cylinder, the high pressure pipe passing through the water in this tank, from the surfaces of which the heat was given off, both by radiation from the external periphery, and by convection from the air passing through the interior of the hollow cylinder. Bearing upon the arrangement of such devices as these, comes the question of the protection of the surfaces of transmitting pipes from loss of heat during the passage. Indeed, in any arrangement of transmission of heat, whether by low pressure or high pressure hot water, or by steam, it will almost invariably happen that, in a portion at any rate of the line of piping, it is desirable that the heat should not be given off from the pipes. And in all such cases considerable economy in fuel will be obtained by a judicious clothing for protection of the pipes with a bad conductor of heat, so as to prevent the heat being dissipated before it has been transmitted to the point where it is wanted. A great variety of substances have been employed for the purpose of protecting the surface of heated pipes, and diminishing the loss of heat which would otherwise occur. The most satisfactory substance for practical work is undoubtedly hair felt with a backing of canvas. The relative amount of heat saved by the use of various substances is given in the following table:—

	Heat transmitted
Naked pipe	100
Two layers asbestos paper $\frac{1}{16}$ inch thick, 1 inch hair felt and canvas cover	15
Two layers asbestos paper, 1 inch hair felt	17
One inch thick hair felt	18
Asbestos moulded with plaster of Paris	32
Slag wool, fibrous	20
„ „ felted	21
Fossil meal (Kieselguhr) moulded	28

These figures hold good for an inch thickness of the material, and it should be noted that an increase of thickness does not mean a corresponding increase of protection; 6 inches of hair felt for example, reduces the loss to one-third only of that from 1 inch thickness.

STEAM.

We now come to the consideration of the employment of steam as a means of transmitting heat from the generating point to the locality of application. Steam may be used at either high pressure or low pressure, although in the amount of heat contained in high and low pressure steam there is but little difference, live steam at 70 lbs. pressure containing only about 3 per cent. more heat units than steam at 1 lb. pressure. The effective power, however, of high pressure steam is greater than is indicated by this difference in

the amount of heat contained. So that the thermometric heat of steam at a pressure of 70 lbs. is 316°, and at 1 lb. 216°·3; and from this it results that in using low pressure steam an allowance of from 30 to 40 per cent. has to be made in the amount of radiating surface. In low pressure steam heating there are two systems of piping generally adopted, known respectively as the two pipe system and the one pipe system. In the two pipe system the rising main is carried to the highest available point above the boiler, and then laid with a fall of about 1 in 120; from this rising pipes are taken to the various coils and radiators, from each of which a smaller diameter pipe is laid into a return main, which is laid with a gradient towards the boiler, the highest point of the return main being below the water line, and no return pipes being connected to one another above this line. In this system it will be noted that each radiator has two pipes connected to it, from which the name of "two pipe system" is derived. In the one pipe system the best arrangement is to use a circuit pipe or main of good diameter, and carried to the highest point available, and laid with a fall of 1 in 120 until it again reaches the boiler, to which it is connected below the water line. This pipe forms the circulating pipe for the steam, and from it rising pipes are taken to the various radiators which convey the steam, and simultaneously return the water of condensation. This is a more economical arrangement, and at the same time, if properly fitted up and constructed, it is efficient and noiseless. It is also possible to supply the radiators by a single pipe taken from the top of the steam boiler, and so arranged that the water of condensation will flow back freely above the water line. This, however, is only advisable in comparatively small installations. It will be seen that in all these low pressure systems the water of condensation flows back by gravity into the boiler—either through the pipes conveying the steam to the radiators or by the relief pipes from same. This obviates the necessity for the use of steam traps.

Heating by high pressure steam is used in large installations, and where steam is generated for other purposes, the advantage being that the steam can be carried to any distance, and may be advantageously employed for use in heating by furnishing the heat necessary to maintain in operation a system of hot water heating in some particular part of the building. In this case the water of condensation is received by a trap and delivered either into a tank, from which it is returned into the boiler, or in some instances wasted.

Exhaust steam may frequently be used with advantage for heating purposes, as steam after being employed in an engine retains the greater portion of its heat, and, if not diffused or utilised for other purposes, may be employed for heating without materially affecting the power of the engine. The exhaust steam, however, contains from 20 to 30 per cent. of water, and a considerable amount of oil or greasy matter which has been employed in lubricating. The use of exhaust steam has the disadvantage that the amount of heat frequently varies very considerably with the amount of work done by the engine, since the engine governor admits steam only in such an amount as is required to preserve uniform speed under varying conditions of work. For the successful employment of a system of exhaust steam heating the piping must be arranged so as to make little or no increase in back pressure on the engine, and to provide for using an intermittent supply of steam. Provision must be made for removing the oil from the exhaust steam, and a safety or back pressure valve should be employed, so as to avoid damage to the engine by any sudden increase of back pressure.

When high pressure steam is used it is not necessary to work the whole installation at the high pressure of the boiler. This may be as much as 120 lbs.; but that in the radiators and their feed pipes may be as little as 10 lbs. or even 5 lbs., reducing valves being inserted. Of these there are a great many forms in use.

Steam traps, also, are varied in form and principle. For small pressures a siphon trap may be used, but only for small pressures with convenience. Then we have float traps, bucket traps, and expansion traps. Of these, bucket traps are the most reliable, expansion traps the most sensitive. None of these will return the water to the boiler; for this, return traps are necessary, which contain an equalising valve admitting steam from the boiler when there is a sufficient accumulation of water in the trap.

RADIATORS.

In both hot water and steam heating the diffusion of heat at the points where it is particularly required may be effected either by the heat being given off from the surface of the circulating pipes or from an enlargement of this surface by means of coils or radiators. When coils are used the pipes forming the coils should rather be connected at their ends than form a continuous line of circuit with return bends, as in the latter case there is a considerable amount of frictional resistance to the flow of steam or water. For direct heating cast-iron radiators are now mostly used, and are made in a great variety of forms and shapes, more or less ornamental. The efficiency of direct radiation is increased by painting, decreased by varnish or enamelling. The only difference between hot water radiators and steam radiators is in the provision of a horizontal passage at the top of the former as well as at the bottom. This is necessary in order

that an air-cock may be used to draw off the air which accumulates from time to time. In some cases, with hot-water radiators, the water enters at the top, and is drawn off at the bottom; but in the majority, both the inlet and outlet are at the bottom of the radiator, and in point of efficiency there is little, if any, difference between them.

In the application of the heat which has been transmitted by means of the pipes, there are three methods which may be employed—styled generally, after American fashion, "Direct," "Indirect," and "Direct-Indirect," or "Semi-Direct." By direct heating it is meant that the radiator or radiating surface is placed in the apartment to be warmed in which the heat is diffused, partly by actual radiation, and, of course, partly by convection from the heated surface. In the indirect method the heating surface is outside the apartment to be warmed, and the heat from it warms a current of air which transmits and diffuses the heat through the apartment. In the "direct-indirect" method the heated surface is placed within the apartment, but a current of air from without enters, passes over the heating surface, and is diffused through the apartment. This is the most usual arrangement in England, though both the others are practised.

Direct heating is less costly than indirect, but there is, of course, the counter-balancing value of the ventilation in the latter case.

BOILERS.

Boilers for heating purposes differ primarily in the principle of their construction, according as to whether they are intended for the production of steam or simply of hot water. The essential difference between the two is that, in steam boilers, provision must be made for the quick liberation of the steam bubbles, and their storage in a reservoir or steam chest above the water line. This of course is not necessary in the boiler intended simply for heating water, although many types of boilers are, with very little modification, suitable for use with hot water or low-pressure steam. As the efficiency of a boiler for low-pressure steam or hot water depends very largely upon provision for a considerable amount of heating surface being exposed to the action of the flame, compared with the cubical contents of the body of water, we find that all the hot-water heaters now in use have their surfaces extended by various devices. The simplest and most rudimentary is the old-fashioned saddle boiler, but this is now almost obsolete. In boilers with extended surfaces these surfaces are arranged so as to provide a sinuous course for the products of combustion, thus depriving them to as full an extent as possible of the heat which they contain.

The greater number of cast-iron boilers now in use are made by joining together either horizontal or vertical sections. These sections are joined in some instances by a screw nipple, in other cases by packed or faced joints, and are held together by bolts. Somewhat similar boilers are also made with vertical sections; but these are more particularly suitable for use in steam heating.

Tubular boilers are constructed either as fire-tube or water-tube boilers—that is, the tubes are sometimes arranged for the products of combustion to pass through, and in others for the water. As examples of fire-tube boilers the well-known Lancashire and Cornish boilers may be mentioned; as examples of water-tube boilers, the Babcock and Wilcox boiler, which is a good instance of the type. The water-tube boilers are especially suitable for high-pressure work; whilst for low-pressure and hot-water work, sectional boilers, either horizontal or vertical, are sufficiently strong, and, being made of cast iron, are considerably cheaper.

Horizontal tubular boilers, and a few hot-water boilers, require to be set in brickwork; but nearly all hot-water boilers now made require no setting, or, at any rate, only a portable setting, with perhaps a thin casing of iron lined with some non-conducting material. Every boiler, whether for steam or hot water, should be provided with a safety valve, of which there are various forms; but care should be taken that it is not possible for the engineer or boiler attendant to manipulate it so as to maintain a higher pressure than that prescribed. Steam boilers will, of course, also have water gauge, try-cocks, and steam-pressure gauge. For hot-water work it is very desirable that thermometers should be fitted to the boilers, so that the temperature of the water on leaving the boiler and its temperature on its return may be ascertained. These thermometers should be set so as to extend deep into the current of flowing water, and there should be no opportunity for the air to gather round the bulb.

As the efficiency of a boiler depends largely upon the stoking of its furnace, the grates should always be of the shaking or dumping variety. A well-stoked steam boiler will burn 15 lbs. or more of coal per square foot of grate per hour; a badly attended furnace only 3 lbs. A pound of good anthracite or steam coal will give about 13,000 heat-units in combustion; a pound of soft coal, 10,000 to 15,000, according to kind and quality. Of this a good furnace should utilise 70 per cent., but many are to be found that will give no more than 50 per cent.

In making calculations for the provision of heating power there are two points which require consideration—first, the amount of heat required, and second, the amount of heat to be obtained from various sources or apparatus. Heat may be measured either by quantity or by intensity. The quantity of heat is expressed in terms of the work

which a given amount of heat will do. The intensity of heat is measured by the more familiar process of consulting a thermometer. The amount or quantity of heat is, in this country, generally estimated by what is called a British thermal unit, or, shortly, a unit of heat. The British thermal unit is the amount of heat required to raise 1 lb. of water from a temperature of 32° to 33° F., and is a convenient term in which to make our necessary calculations.

The amount of heat required to warm any particular apartment depends upon the construction of the walls, floor, ceiling, windows, and doors, and upon the rapidity with which the air of the room is changed; for in order to warm any particular apartment to the desired temperature, all the parts must be raised to that temperature as well as the atmosphere of the room. Numerous careful experiments have been made by Péclet and other experimenters as to the loss or diffusion of heat which occurs with various forms of construction of walls, windows, and other parts of the building. To tabulate all these experiments, or even all the results at which these investigators have arrived, would occupy more space than I have at my disposal, and would be unduly wearisome. I will therefore reduce these results down to simple and easily-remembered figures. For ordinary temperatures and pressures, 55 cubic feet of air, on the average, will absorb 1 heat-unit in being warmed 1° F. The heat-units, therefore, required for warming the air supplied and used by any ventilation arrangements can be found by multiplying the number of cubic feet of air by the difference of temperature desired between the internal and the outside air, and dividing by 55. As regards the structure of the apartments, it is, for practical calculations, sufficiently near accuracy to neglect all inside walls, floors, and ceilings, and consider only the exposed or outside surfaces. For these a fair average allowance would be 1 heat-unit for glass, and one quarter of a heat-unit for walls, per degree difference of temperature per square foot per hour. In the warming of rooms where no special means of ventilation are provided it will suffice to consider that the air of halls and corridors is changed three times per hour, that of rooms on lower floors twice per hour, and that of rooms on the upper floors once per hour, thus making fairly adequate allowance for the changes of atmosphere taking place by diffusion through the bounding superficies of the apartment and the opening and shutting of doors. Putting these rules into the shape of a formula, we should have

$$U = \left(\frac{N}{55} C + G + \tfrac{1}{4} W\right) T,$$

where U is the number of heat-units required per hour, N the number of times the air is changed per hour, C the cubic contents of the room, G the area of the glass, W the area of exposed wall surface, and T the difference of temperature between the air in the room and outside.

The determination of the amount of heating surface required to furnish the necessary heat-units must be made with consideration of the arrangement of heating surface, its temperature, and the temperature of the surrounding air, and, where indirect heating is employed, the velocity of the air current.

Low radiators are more effective per foot of heating surface than tall ones, single radiators than those in multiple rows, horizontal pipes than vertical, small pipes than large ones.

The heat transmitted from direct-action surfaces varies in the amount per degree difference of temperature with the difference of temperature. To give the exact figures would require a series of tables; but, briefly, 1·5 heat-unit may be quoted as the amount per degree difference of temperature, with 60° difference for 4-inch horizontal pipe or 40-inch single radiator, and 1·8 heat-unit for the same with 150° difference.

Similarly, with indirect action, with a velocity of 2 feet per second, 3 heat-units per degree difference of temperature per square foot per hour would be given; with 20 feet velocity, 9 heat-units.

In making calculations for the warming of rooms which are to be occupied by a large number of persons, it must not be forgotten that they themselves do a good deal of warming to the extent of 191 heat-units each per hour.

Under certain adverse circumstances the radiating surface should be increased, for which an allowance should be made of:

10 per cent. where exposure is northerly or winds cold;

10 per cent. where building is heated in daytime only and location not exposed;

30 per cent. where building is heated in daytime only and location exposed;

50 per cent. where building is heated during winter months intermittently, with long intervals (days or weeks) of non-heating.

Inasmuch as it is within the common experience of us all that the amount of heat required to be supplied to any building varies almost hourly, the employment of thermostats tends largely to the economical working and increase of comfort in the use of warming apparatus, and we should do well to advise our clients to incur the slight additional expense of these valuable accessories.

The following are some of the tables referred to in the lecture:—

TABLE I.—Loss of Heat from Glass Windows per Square Foot per Degree Difference of Temperature F. per Hour. (Péclet.)

Height of window	3ft. 3in.	6ft. 7in.	10 ft.	13ft. 3in.	16ft. 3in.
Loss in British thermal units	0·98	0·945	0·93	0·92	0·91

TABLE II.—Loss of Heat Through Walls in British Thermal Units per Square Foot per Degree Difference of Temperature F. per Hour.

Thickness in inches	Péclet			German Government
	Single wall. Brick or stone	Hollow wall	Solid wall	Single wall. Brick or stone
4	0·43	0·36	0·12	0·68
8	0·37	0·30	0·065	0·46
12	0·32	0·25	0·045	0·32
16	0·28	0·21	0·033	0·26
18	0·26	0·19	0·031	—
20	0·25	0·18	0·030	0·23
24	0·24	0·17	0·029	0·20
28	0·22	0·15	0·027	0·174
32	0·21	0·13	0·025	0·15
36	0·20	0·12	0·020	0·129
40	0·18	0·10	0·018	0·115

TABLE III.—British Thermal Units given off from Cast-Iron Pipes and Radiators in Still Air by Radiation and Convection per Square Foot per Degree Difference of Temperature F. per Hour. (Péclet.)

Difference of temperature.	Horizontal pipe of diameter			
	6 in.	4 in.	2 in.	1 in.
	Radiators equivalent to pipe with heights			
Degrees F.	40 in. double	40 in. single	24 in. double	12 in. single
10	0·55	0·62	0·66	0·85
20	1·11	1·25	1·32	1·72
30	1·18	1·34	1·42	1·84
40	1·24	1·40	1·48	1·92
50	1·29	1·46	1·54	2·01
60	1·33	1·50	1·58	2·06
70	1·36	1·54	1·63	2·12
80	1·40	1·58	1·67	2·18
90	1·43	1·63	1·72	2·24
100	1·47	1·66	1·76	2·28
110	1·51	1·71	1·80	2·34
120	1·54	1·74	1·84	2·39
130	1·57	1·78	1·88	2·44
140	1·61	1·81	1·91	2·48
150	1·64	1·84	1·94	2·53
160	1·66	1·87	1·97	2·57
170	1·69	1·91	2·02	2·62
180	1·72	1·94	2·05	2·65
190	1·75	1·98	2·09	2·71
200	1·78	2·01	2·12	2·76
225	1·87	2·12	2·24	2·91
250	1·97	2·23	2·35	3·06
275	2·07	2·34	2·47	3·22
300	2·17	2·45	2·58	3·37
325	2·27	2·55	2·70	3·50
350	2·37	2·67	2·82	3·66

9, Conduit Street, London, W., 7*th May* 1898.

CHRONICLE.

THE ANNUAL ELECTIONS.

Nominations to the Council.

The following nominations to the Council have been made by Fellows and Associates under the provisions of By-law 30, namely:—

Delissa Joseph [*F.*]: nominated by Edmund Woodthorpe, W. Hilton Nash, T. E. Knightley, Richd. M. Roe, R. Creese Harrison, Benjn. Tabberer, and Lewis Solomon, *Fellows*.

John Tavenor Perry [*F.*]: nominated by T. Hayter Lewis, E. B. I'Anson, Wm. Henman, and Fred. H. Reed, *Fellows*; Ch. Henman, Augustus W. Tanner, and R. Elsey Smith, *Associates*.

Nomination to the Practice Standing Committee.

The following nomination to the Practice Standing Committee has been made by Fellows and Associates under the provisions of By-law 49, namely:—

Francis Thomas Wilberforce Goldsmith: nominated by Henry L. Florence, *Vice-President*; Lewis H. Isaacs, Thomas Batterbury, J. Macvicar Anderson, Alfred Waterhouse, Ed. W. Mountford, Geo. H. Fellowes Prynne, *Fellows*; S. B. Russell, James S. Gibson, Harry W. Pye, and Frank J. Potter, *Associates*.

Suggested Limitation of Term of Office for Members of Council.

The following communication, headed "An Open Letter," is addressed by Mr. C. B. Brodie [*A.*] to the President, Council, and Members of the Royal Institute:

17 *Southampton St., 25th April* 1898.

Gentlemen,—Much has been written lately about the Council of our body having become a sort of close corporation, the members of which nominate each other constantly, and investigations I have made tend to show there is some justification for the remarks.

I do not intend to write to a public print anonymously, but to ask the Council to consider what I

write, and to publish it in our JOURNAL for the information of members generally. It is a matter which in no way concerns the outside public. It is purely domestic.

Taking the nomination list just issued by the Council, I find that 25 out of the 38 members of Council nominated are "starred" as being members of that body. This should show us 26, because Mr. Pratt is now a member, whilst Mr. Hall, Mr. Pite, Mr. Gibson, and Mr. Stokes have all previously served, so that brings the total to 30 old members of Council nominated out of 38 names on the list of ordinary members.

I should not wish to be understood as taking the slightest objection to any name on the list. I merely say that the facts show that there is reason in a complaint made, and made more freely perhaps than the Council are aware of.

To a large number of members it seems a great pity that there is not in the By-laws a limit stated to the time a member may remain on the Council. Such a limit exists in almost all Societies with which I am acquainted. Take the Architectural Association (London) as an example, a Society the rejuvenescence of which is becoming proverbial, whilst it stands for all that indicates life, energy, and progress in our profession. How is this result attained? Largely, I believe, because the By-laws allow only a certain number of the old Committee to be re-elected each year, and provide that no member may sit on the Committee as an ordinary member for more than three successive sessions. This would probably be too short a term for the Institute. But that some limit should be put I am convinced. Take again the nomination list just issued, and among those nominated I find that one has been a member of Council for 14 consecutive sessions, another for 13, two for 12, two for 11, two for 10, two for 9, two for 8, and one for 7—all consecutive sessions. One member now renominated for a seat on the Council was on it as long ago as 1881.

Would it not be better for the Council to propose a limit such as that suggested rather than that such a proposal should come from outside? The By-laws are now being amended, and the Lords of the Privy Council approached to approve the amendments. The end of By-law 27 added also to By-law 29 would probably meet the case, and the amendments already passed could easily be held over until next Session, and the whole approved together.—I am, yours obediently,

(*Signed*) C. H. BRODIE.

An Invitation from the Belgian Society.

The following letter, addressed to the President and members of the Institute, has been received from the Société Centrale d'Architecture de Belgique:—

MESSIEURS,—Nous avons l'honneur de porter à votre connaissance que notre Société organisera, du 13 au 21 août prochain, une excursion en Champagne et Bourgogne (France). Elle compte visiter Reims, Châlons, Troyes, Langres, Dijon, Avallon, Vézelay, Auxerre et Fontainebleau.

Le retour se ferait le dimanche 21, avec arrêt d'une partie de la journée à Paris.

Le prix de l'excursion sera d'environ 250 francs, tous frais compris (frais de voyage en seconde classe au départ de Bruxelles, frais d'hôtel, 1er et 2^{e} déjeuners, dîner, vin compris, voitures et entrée dans les monuments).

Dans le but d'affermir les relations de bonne confraternité que nous avons avec tous nos confrères de l'étranger, notre assemblée a décidé d'admettre à cette excursion les membres de nos Sociétés correspondantes qui voudraient y participer et bénéficier ainsi des avantages qui nous sont généralement accordés.

Nous venons vous faire part de cette décision, chers confrères, et vous prier de la porter à la connaissance des membres de votre Société.

Les avis d'adhésion devront parvenir à notre Vice-Président, M. Maukels, Rue Ortélius 5, à Bruxelles, avant le 15 juin prochain. Des itinéraires détaillés, ainsi que les diversr enseignements, prix, parcours, logement, etc. . . relatifs à l'organisation du voyage, seront alors envoyés à ceux de nos confrères qui auraient manifesté le désir de prendre part à l'excursion, et les adhésions définitives devront être parvenues à la même adresse que ci-dessus le 15 juillet au plus tard.

Nous vous prions d'agréer, chers confrères, l'assurance de nos meilleurs sentiments.

Le Vice-Président, Le Président,
(*Signed*) G. MAUKELS. (*Signed*) DUMORTIER.

Rue Ortélius 5, Bruxelles: le 26 avril 1898.

The late Augustus Laver [*Hon. Corr. M.*].

The death is announced, on the 27th March, of the distinguished American architect, Augustus Laver, at the age of sixty-four. Mr. Laver, who was by birth an Englishman, commenced his professional career in Canada, where he was the author of the Parliament Buildings at Ottawa. Later he entered upon practice in the United States, and designed many notable buildings, the New York Capitol at Albany and the City Hall of San Francisco being amongst the most important. Mr. Laver had been an Hon. Corr. Member of the Institute since 1879.

A Donation from Signor Giampietri [*Hon. Corr. M.*].

At the meeting of the 18th April the Chairman drew the attention of members to a charming water-colour drawing, lately on exhibition at the Dudley Gallery, of the Stylobate of the Temple of Antoninus and Faustina, Rome, the work of Signor Settimio Giampietri, one of the recently elected Hon. Corr. Members, and presented by him to the Institute.

REVIEWS. LXXII.

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SPECIFICATIONS.

Specifications in Detail. By Frank W. Macey, Architect. 8*o. Lond.* 1898. *Price* 21*s.* [*Messrs. E. & F. N. Spon,* 125, *Strand.*]

The epidemic of writing on the subject of specifications increases in strength, and it is to be hoped that the results may be satisfactory. There is indeed room for improvement. The slipshod English, the disorder, the reappearance of allusions to the same item in various parts of the document, the recurrence of stock phrases like a refrain, and the fond device of describing things that will never be supplied, are some of the curious characteristics of the ordinary specification. Whether a royal road to specification writing can be devised may be doubted, and it is certain that a specification produced by the perfunctory adoption of ready-made descriptions is unworthy of comparison with that which is the result of the systematic and thorough study of construction. Without this and the judgment which only such study can ensure, no architect can hope to specify work in a rational way, preserve a reasonable consistency in *the degree of detail* of his descriptions, nor as to the *relative* quality and finish that he may require in the various parts of the same building.

To know exactly what he wants, to describe it precisely and see that he gets it, are the qualifications which the specification writer of the future may possibly possess. There are indications, legal or other, that the general public is becoming more critical of the obligations of the architect to his employer, and one of these obligations is a thorough knowledge of his subject when he writes a specification.

The method of this book is not new—it is that of *Wightwick's Hints to Young Architects*; but it is more comprehensive. Each trade is dealt with in the usual order, and is illustrated by numerous marginal sketches. Whether they are all necessary is open to question. Surely no one with technical knowledge above that of the mere novice requires a sketch of a drawer-knob or a cup-hook. The clauses of each trade are interspersed with items of information about materials and construction such as are to be found much more comprehensively stated in the text-books. The student who rejoices in the appearance of a book of over six hundred pages ostensibly on specifications, will be reminded of the proportion of sack to bread in Falstaff's tavern bill. The artless simplicity of some of the statements is refreshing—"lignum vitæ" (a very hard wood); "there is no frieze-rail to a four-panel door." The use of the word "provide" in two different senses in this book is objectionable. Mr. Rickman, in his Paper on Specification Writing, says: "'Supply' is a term which, if used in place of the usual words 'provide' and 'fix,' will increase the clearness of the specification and avoid some prolixity."

The author might with advantage have given more directions for the *order* of a specification—the prime difficulty with the student. In a long specification adherence to the classification by trades is a lucid and convenient custom. The specification of stone templates in the carpenter is novel, and is not an improvement.

Too little use is made of the preambles to trades. General clauses at the head of each trade may be used to save much subsequent writing. In the items of joinery grounds are described time after time. The author adopts the practice of numbering each clause, but begins with No. 1 in each trade. The prime object of numbering the clauses is the facility of indexing or cross-reference; numbers repeated defeat that intention. There should be only one series of numbers for the entire specification. Of the use of numbers to designate doors, windows, or rooms, of tabulations, of the convenience of describing various things by reference to the points of the compass, the author gives no hint.

The use of provincial terms, like "raglet" and "tingle," is to be deprecated. Nor is the introduction of novel conditions, such as the following, to be commended:—

> The contractor shall at his own expense make copies of all drawings, specifications, and details required for the work; due facilities will be afforded for this purpose.
>
> The timber for joiners' work to be obtained from an approved London (or other port) merchant, who will give a guarantee as to its having been in stock four years, and that it will not shrink when fixed. The contractor is to obtain this guarantee in such form as the architect shall require, but this guarantee will not relieve the contractor of his liability in any way for the quality of the material.
>
> In order to test the weight of the sheet lead used the architect is to be at liberty to cut out samples from any piece of the lead work *after having been laid*; the contractor is to make allowance in his estimate for such tests, and is to replace such damaged work with entirely new sheets.

Vexatious clauses such as these always increase the cost of the work; the absurd conditions in the form of contract of the London County Council (some of which are now abandoned) are well-known illustrations. To make the "report on the sanitary condition of a house" resemble other reports of the kind, it should not only describe faults but suggest remedies. The description of the nature of the soil is not a matter for a specification, nor a responsibility which the architect should adopt. The numbering (or lettering) of every manhole is in accordance with the best practice, but it is unnecessary to describe each one separately. The description of terra-cotta is inadequate. In the mason no allusion is made to the various methods of defining the sizes of stones. In the specification of rubble work we see no

mention of brick tacking or of the common and convenient practice of building the angles, inside of a rag-stone wall, of brick. The mixing up of the descriptions of carpentry and joinery is inconvenient, and makes reference difficult. There are no suggestions as to the order of specifying joinery, and for a large building this is an important consideration. Our venerable acquaintance—the stereotyped preamble to the carpenter's specification—reappears; a description of materials which is not likely to be either supplied or insisted on. However, the definite limitation of the size of knots is a step in the right direction.

Familiarity with the ordinary principles which regulate the sorting of the qualities of timber and deals by the shipper as to shakes, wanes, knots, and sapwood are worthy of the attention of the architect. It is difficult to understand what is the object of specifying the pitch of roofs (p. 393). In the plasterer we have the clause, "To be best long black (or white) bullock's hair." "White" is original; "black" should be "back," as being longer. The diagram of gaspipes (p. 461) is not in accordance with ordinary practice, a horizontal branch from the rising main usually supplies two floors—pipes rising from it for one floor, and dropping for the other. The description of British polished plate is uncommon, "$\frac{1}{4}$ thick full" (or bare) should be "about $\frac{1}{4}$" thick"; if it is all selected of one thickness, the price is increased.

The book, despite its faults, contains a great store of information, especially about domestic fittings, such as is not to be found in the ordinary books on construction. It is on the whole a very creditable example of care and industry. It may be recommended to every architect and surveyor as a valuable book of reference. The book, as a trade production, is well done. There is a copious index; the binding and printing is worthy of the well-known publishers who have produced it, and the success which it deserves may be confidently predicted. JOHN LEANING, F.S.I.

MINUTES. XIII.

At a Special General Meeting held on Monday, 2nd May 1898, at 8 P.M., Mr. H. L. Florence, *Vice-President*, in the Chair, with 12 Fellows (including 7 members of the Council), 15 Associates (including 1 member of the Council), and 1 Hon. Associate, the Minutes of the Special General Meeting held Monday, 18th April 1898 [*ante*, p. 336], were taken as read and signed as correct.

On the motion of the Chairman, seconded by Mr. W. M. Fawcett, *Vice-President*, it was

RESOLVED, *nem. con.*, that the resolutions of the Royal Institute concerning the clause to be added to By-law 9, and the alterations in By-laws 30 and 31, passed at the Special General Meeting of the 18th April [see Minutes, *ante*, p. 336], be confirmed.

The Special General Meeting then terminated.

At the Sixty-fourth Annual General Meeting (the Thirteenth General Meeting of the Session), held Monday, 2nd May 1898, at the conclusion of the above-mentioned Special General Meeting, Mr. H. L. Florence, *Vice-President*, in the Chair, with 7 Fellows (including 15 members of the Council), 12 Associates (including 1 member of the Council), and 1 Hon. Associate, the Minutes of the Ordinary General Meeting held Monday, 18th April 1898 [p. 336], were taken as read and signed as correct.

The Hon. Secretary announced the decease of the following members:—Augustus Laver, *Hon. Corr. Member* (San Francisco), elected in 1879, and Walter Seckham Witherington, *Fellow*, elected in 1881.

The following Associate, attending for the first time since his election, was formally admitted, and signed the register—namely, William Henry Stanbury (Gibraltar).

The Chairman having asked the Meeting to give its approval to a recommendation from the Council to admit the Aberdeen Society of Architects to alliance with the Institute, it was

RESOLVED, that the Royal Institute of British Architects do admit to alliance therewith, under the provisions of Section XVII. of the By-laws (Nos. 77–81), the following Society—viz. "The Aberdeen Society of Architects."

The Chairman announced that Mr. Arthur Baldwin Hayward had passed the Statutory Examination held by the Institute on the 21st ult., and had been granted a Certificate of Competency to act as District Surveyor under the London Building Act.

The Report of the Council for the official year 1897–98, a copy of which had been previously issued to every member resident in the United Kingdom, having been submitted and taken as read, its adoption was formally moved by the Chairman, and seconded by Mr. B. Ingelow [*F.*]. By direction of the Chairman the Secretary then read the following report of the Auditors:—

To the Royal Institute of British Architects.

GENTLEMEN,—We have examined the vouchers, books, and accounts generally of the Institute for the year ending 31st December 1897, and it is with great pleasure that we are able to report our entire satisfaction. The books have been carefully and accurately kept, and an efficient control over the expenditure has been maintained. We have examined and verified the several securities, and note that the Certificate of the £40 Madras Railway 4½ per Cent. Stock, purchased on the 3rd December 1897, has not yet been delivered by the bankers.

The year's working shows a net profit of £1,116 1*s.* 11*d.*, this being £516 1*s.* 11*d.* in excess of the estimated profit. The total cash balance of ordinary funds in the hands of the bankers on the 31st December 1897 was £1,568 17*s.* 8*d.* In addition to this the invested funds have been increased by donations and transfers from income to £4,970 0*s.* 6*d.* The Institute therefore occupies a better financial position than it has done for some years past.

We desire to express our cordial appreciation of the services rendered to us by Mr. W. J. Locke, Mr. H. G. Tayler, and the other officials of the Institute.

EDMUND WOODTHORPE } *Hon.*
15th April 1898. OWEN FLEMING } *Auditors.*

A discussion on the Annual Report ensued [see *Appendix*], in the course of which Mr. Max. Clarke, Hon. Secretary of the Science Standing Committee, asked for an explanation of the omission from the printed Report of that Committee of a clause relating to the publication in book form of the results of the Brickwork Tests, as contained in the Report originally sent in to the Council; and moved that such clause either be inserted in the printed Report, or the words "Revised by the Council" be added after the heading thereof. The Chairman, members of the Council, and members of the Science Committee having spoken on the matter, and the Chairman having pointed out that some

misapprehension existed thereon, it was ultimately agreed, on the motion of the Hon. Secretary, seconded by Mr. Matt. Garbutt, that a footnote should be added to the Report stating that the Council would consider the advisability of publishing the results of the Brickwork Experiments in the form proposed by the Committee. The question of the adoption of the Report was then put from the Chair, and it was

RESOLVED, *nem. con.*, that the Report of the Council for the official year 1897-98 be approved and adopted.

The lists of attendances of members at the several meetings of the Council and Standing Committees during the official year having been submitted and taken as read [see *Supplement* No. 13], the following members were appointed scrutineers to direct the election of the Council and Standing Committees for the ensuing year of office, and report the result thereof to the Business General Meeting of the 6th June—namely, *Fellows*: H. P. Burke Downing, John Hebb, F. Hooper, Delissa Joseph, Zeph. King, Hugh Stannus, and others to be appointed by the Council. *Associates*: W. A. Forsyth, H. Hardwicke Langston, F. W. Marks, H. A. Satchell, E. Wimperis, and H. A. Woodington.

On the motion of the Hon. Secretary, a vote of thanks was passed to Messrs. Edmund Woodthorpe [*F.*] and Owen Fleming [*A.*] for their services as Auditors of the past year's accounts; and Messrs. Zeph. King [*F.*] and F. W. Marks [*A.*] were nominated Auditors for the ensuing year.

The Statutory Board of Examiners were re-appointed as follows:—Messrs. Lewis Angell, Francis Chambers, Professor Banister Fletcher, Ebenezer Gregg, F. W. H. Hunt, E. B. l'Anson, Professor Kerr, J. Douglass Mathews, Lacy W. Ridge, Professor T. Roger Smith, Messrs. Benj. Tabberer and T. H. Watson.

The proceedings then closed, and the Meeting separated at 10 P.M.

APPENDIX.—DISCUSSION ON THE ANNUAL REPORT.

The motion for the adoption of the Report having been put from the Chair, and seconded by Mr. Ingelow,

MR. JOHN HEBB [*F.*] directed the attention of the Council to the comparatively small number of members as shown by the Report—598 Fellows and 1,001 Associates, and impressed upon the Council the necessity of offering some inducements to architects to join the Institute. Considering the number of practising architects in the United Kingdom, it was most regrettable they should have so few on the Institute books. The alterations the Council had made in the premises might attract country members, but it was not a very hopeful view. The Metropolitan members constituted a very large number, and, great as the difficulties were, he submitted that some effort should be made to induce outsiders to join. He congratulated the Art Standing Committee on their courage in protesting against the vulgarisation of the houses on the Duke of Bedford's estate. The Society for the Protection of Ancient Buildings had been urged to protest, but hesitated to do so, feeling that the houses in Russell Square and the neighbourhood could scarcely be regarded as ancient buildings. Although, unfortunately, the Art Committee's action had been unavailing, yet the protest had been made, and might at some future time bear fruit. There were certain corporate bodies to whom some similar protest might be addressed, notably those of Gray's Inn and Lincoln's Inn. New Square, in Lincoln's Inn, had lately been "beautified" by having the fronts of the houses coloured and the character of its buildings considerably altered. The buildings at the beginning of this century, though not of great artistic value, were certainly of historic interest. Those in Russel Square, particularly, ere well built, well proportioned, and had an extremely agreeable appearance; they possessed, too, an historic value which ought to have preserved them for future generations.

MR. WILLIAM WOODWARD [*A.*] desired to make a few observations on the Report, which he hoped would be taken, as he intended them, in the nature of friendly criticisms. On page 35 (giving the pages as in the *Supplement*) he noticed that the comparison with the number of members of the previous year, which was usually given, had been omitted from the Report. He thoroughly agreed with Mr. Hebb that it was desirable their numbers should be increased. In 1898 there was a total of 1,652 members, as against 1,643 of the preceding year, showing a net increase of nine. Eight Fellows unfortunately had died, and eight had been elected, so that practically the number of Fellows remained as before. On page 36 it was stated that the Board of Examiners had prepared a new syllabus of the examinations. He had not been able himself to compare the new syllabus with the old one, but he had read in the JOURNAL for January 8th, 1898, what was certainly an expostulation by Mr. Arthur Cates with reference to the revised syllabus. Mr. Arthur Cates, as all knew, had given a great deal of time, labour, and trouble to these examinations, and was thoroughly aware of all the details connected with the syllabus. He (Mr. Woodward) should take Mr. Cates's opinion that it was in many instances undesirable to alter the syllabus, and that the new syllabus was not so satisfactory to students as the old one. With regard to the Royal Gold Medal (a subject upon which he had observed a few weeks ago) he trusted that in future years the Institute would take more interest in the subject, and relieve the Council of what he was sure they desired to be relieved of, namely, the responsibility of selecting and nominating the recipient for the Royal Gold Medal. With reference to the Festival Dinner, on page 37, the accounts showed a deficit of a sum of £24, which was to be regretted. With regard to the extra floor to be taken over from the Architectural Union Company, the rent was stated, but they were not told whether this included any proportion of the rates and taxes, or whether it included insurance, or what rent was to be obtained from the subletting of the two rooms. The tea and smoking room, he had no doubt, would be well patronised by younger members; but elderly gentlemen would not be willing to mount to the second floor to find a smoking room when, in the immediate vicinity of the Institute, there were properly appointed smoking rooms on the ground floor. Another point connected with this matter: had the Council the power to take this lease for £175 per annum without consultation with the general body? Clause 17 and clause 22 of the Charter vested the property in the Royal Institute, and he was not sure that the Council were justified, or had the power, to enter into an expenditure of this kind without the previous sanction of the general body. Coming to the Report of the Art Standing Committee, with regard to the new Government Offices in Whitehall, he had on a previous occasion protested against plans being placed before the Select Committee of the House of Commons, which had been described and accepted as plans of the Royal Institute, when, as a matter of fact, they were only plans of individual members. Another point with respect to the new Government Offices: reference had been made at a previous meeting to the negotiations between the Institute and the Government, and although he had been very properly informed that inasmuch as those negotiations were of a confidential character, it would be impossible to divulge them, still some reference should have been made in this Report as to whether or not the communications were still confidential. After the speech of the Duke of Devonshire at the Royal Academy Dinner, last Saturday, he apprehended they were not confidential, because the Duke was reported as saying: "I am happy

to be able to state that we have been fortunate enough to secure the assistance and the advice of Professor Aitchison, President of the Royal Institute of British Architects, and a member of the Royal Academy, in regard to the great building scheme now under the consideration of the Government, and I can only express the hope we may succeed, as it is our intention to succeed, in erecting a series of buildings which shall not be unworthy of the site on which they are to be erected, or for the purposes to which they are to be devoted." That was a somewhat ambiguous observation, which might mean one of three things. It might mean that the President was to be employed by the Government in the ordinary way as an architect; it might mean that the President was to be empowered to employ another architect; or it might mean the President was to assist the Office of Works as to the designs. He would only repeat that if the President was empowered to employ another architect on the design of one or either of the buildings, that he would employ a member of the Institute. With regard to Russell Square, he differed entirely from Mr. Hebb. The action of the Art Committee opened the door to very serious complaint, and led him to inquire where it was to stop. Everyone knew that there was a large hotel to be built in Russell Square by Messrs. Maple, which had already disfigured one side of the Square. There were certain elevations to which this paragraph probably referred, which had been altered from their original character to a more modern style. But he maintained that the Institute had no right whatever to interpose in questions of that kind between a freeholder and his architect. If the Duke of Bedford had listened to the protest, and had thought the Institute was justified in criticising the designs for these elevations, the result would have been that his architect would have been dismissed; and he ventured to think the architect would have had a very clear action for libel against the Institute. Where was such a thing to stop? One might not like the elevations in Russell Square; another might not like the elevations in South Kensington; someone else might not like the elevations in a third locality; but was that any justification for entering a protest of this kind, interfering between a client and his architect? For, although the Duke of Bedford was a large freeholder, they were equally as little justified in interfering in the case of any single building. The alterations were still going on; fortunately the Duke had not taken any notice of their protest. Touching the Report of the Practice Standing Committee, the question of professional charges was a very important one, and great danger of litigation arose from it, and he was glad to see that the Practice Committee had taken it under their charge. But he regretted that a period of over four months had elapsed since the Committee sent the report to the Council. He had on a former occasion accused the Council of procrastination, and he thought that in a case of this sort it would have been very desirable if they could have seen their way to expedite the question. Then there was a reference to the Draft Bill of the London County Council for amending the London Building Act. At the meeting on 29th November 1897 he had suggested the Council's sending out a circular, inviting opinions from architects as to the working of the Building Act, and his suggestion had been acted on, he having received a circular on the 17th December following. The Practice Committee say in the concluding paragraph of their Report that "As the Bill was already before Parliament, it was decided to confine the attention of the Committee for the moment to the consideration of the points raised by the Draft Bill. This was considered in detail, and a report thereon sent to the Council." But at the time the circular was sent out the matter was not before Parliament, and therefore the Council had given away the whole object they had in view by not calling a meeting together and sending in a report to the London County Council, as was originally intended. Much good might have resulted if the views of the Institute had been brought before the Government. With regard to the Report of the Science Standing Committee, they all agreed that the Institute was deeply indebted to the gentlemen who had taken such pains in conducting the brickwork experiments. Definite and most useful information had resulted from those tests. He trusted the Institute would see its way to continue not only the tests of brickwork, but also tests of building stones they were in the habit of using. With regard to the financial statement, it gave him the utmost satisfaction in saying that the Council and the officers were to be congratulated to the full for the balances shown. The investments during the year amounted to over £1,100, and a balance of £1,000 was estimated for the current year. That was a state of things which had not occurred in the Institute for many years, and was a very happy augury for the future. He would endorse a suggestion once made by Mr. James Brooks, that the balance—which, he hoped, would go on year after year, and perhaps be considerably increased in the future—would be devoted to a fund which should result in the purchase of their own premises and the erection of a building for the Royal Institute of British Architects, in the same way as had been done by the Surveyors' Institution. He was very glad indeed to endorse the expenditure which had been made in remuneration to Mr. Tayler and other officials for the efficient way they had acted during the absence of their lamented Secretary, the late Mr. William H. White.

The Hon. Secretary, remarking on Mr. Hebb's suggestion that the Council should do something to encourage members of the profession to join the Institute, reminded Mr. Hebb that Mr. Penrose, at the end of his term of office as President, had suggested steps being taken to bring the claims of the Institute before architects who were not members; and, in consequence, a Committee was appointed to consider the matter. The Committee, which included many leading members of the profession, held numerous meetings, and every possible suggestion that could be put forward to induce gentlemen to join the Institute was considered by them; and besides taking the views of members in London, suggestions were invited and obtained from the Allied Societies. The result was the series of recommendations brought before the Institute last year, and passed, which involved the alteration of one or two By-laws, some of which alterations had been confirmed only that evening. The Committee had sat for a year and a half, and had done all they could to get suggestions; but, if Mr. Hebb could propose any means by which members of the architectural profession could be induced to join their body, they would be grateful to him. As a matter of fact, there were a great many architects in good practice who did not take the trouble to join at all, much less become Fellows. He could not help feeling that these gentlemen were somewhat wanting in *esprit de corps* or professional brotherhood. This was not the case with the institutions of other professions.

Mr. E. W. Hudson [*A.*] thought that if there was any way by which members who had already joined could be induced to attend the meetings, a great point would be gained. When foreigners, for instance, and others from a long distance, came to read Papers to the Institute, it was not much encouragement for them to see rows of empty seats. Besides that, it meant loss of prestige for the Institute. Perhaps the alterations and improvements in the premises, with the temptations of the smoking-room upstairs, would make members better acquainted with the premises. He hoped it would have some effect.

Mr. Owen Fleming [*A.*], Hon. Secretary of the Art Standing Committee, said with reference to Mr. Woodward's remarks on the new Government offices in Whitehall, that the Art Committee simply suggested to the

Council what occurred to them as desirable, and the Council modified and acted upon those suggestions. Mr. Woodward was not quite accurate in his view that the Select Committee smiled and bowed them out, as he would show by running over the different suggestions. The Select Committee of the House of Commons which sat previously to the last Select Committee were hesitating between a parallel line at the southern end of Whitehall, and an angular line—a line that ran across from the corner of the existing buildings to the corner of Great George Street. The Institute advised parallel lines, which the Government adopted. The Institute, again, advocated the Great George Street site, extending right through from Whitehall to St. James's Park. The Government decided that any extension beyond the present scheme should be in that direction. The Institute rather objected to the proposed works at Downing Street, and those works have been postponed for the present. The Institute objected to the triangular building which was proposed to be erected along the line of the Mall, to contain the Office of Works, the Civil Service Commissioners, and the Office of Woods. That building had been abandoned at present. The Institute suggested the setting back of the buildings between the Admiralty and Drummond's Bank, the removal of Drummond's Bank, and the widening of a portion of Whitehall so as to bring it into some relation with the lower portion of Trafalgar Square. The Government, without expressing any adverse opinion to the proposal, suggested it was really a matter for a metropolitan improvement. He thought they were possibly right. The only case in which the Government decided against the Institute was in the case of the War Office, and as to that time would show whether the Government or the Institute were right. With regard to Russell Square the Art Committee were absolutely unanimous in their suggestion, and the different views expressed by Mr. Hebb and Mr. Woodward suggested that there were differences of opinion within the walls of the Institute on that point. With regard to the Science Standing Committee, he was anxious to know what was being done as to the collation of the results of the brickwork experiments. He was not clear whether the matter was in the hands of the Council or the Science Committee, but the information would be very useful if it were before the Institute. He would suggest, too, that there was great need of information as to the strength and the making of bricks; and now they were in better funds, would it not be possible to make a grant of £50 or £100 a year to the Science Committee for original investigations? If the thing were done systematically on a scientific basis very useful information would be obtained upon points of construction upon which nothing or very little was known.—Speaking on the question of increasing the number of members of the Institute, the speaker said that Associates felt that they had not very much voice in the Institute as a whole, but if a few Associates and a few Fellows could get together and talk over this question frankly and with a desire to come to some sort of agreement, he was not quite sure that the Institute as a whole would not benefit.

Mr. H. HARDWICKE LANGSTON [*A.*] suggested, with regard to the question of bringing into the fold those members who liked to stand aloof, that if the Council were to arrange among themselves that gentlemen who had been members of the Council should retire after some five years and give place to others, the profession generally would have more interest in the welfare of the Institute. The Institute should attract all who were members of the profession; it should be the recognised centre—a body which should speak with effect—and it did not tend to give it that quality when gentlemen remained year after year as if they had a permanent right to a seat upon the Council. He had been an Associate for many years, but there was nothing that inspired him to seek to be a Fellow, because he could not see how this reform should take place unless it came from the Council itself. He begged humbly to submit that members' term of office on the Council should be limited to five years, and that they should then retire as a matter of course.

The HON. SECRETARY suggested that if Mr. Langston had become a Fellow years ago instead of remaining an Associate, he might probably have been a member of the Council by this time. But if the great bulk of members remained Associates they had little chance of becoming members of the Council. It rested with members to propose gentlemen in addition to those nominated by the Council. If members exercised those rights they would probably very likely get in; but the Council naturally nominated those they thought best able to do the work.

Mr. MAX. CLARKE [*A.*], Hon. Secretary of the Science Standing Committee, said he should like to answer Mr. Owen Fleming's remarks as to the Science Committee, more particularly as in the Report of the Committee a clause which would have answered Mr. Fleming's question had been omitted. The present state of affairs with regard to the publication of the tests of brickwork stood thus. Mr. Dibdin had written offering to publish the whole of the series of brickwork experiments in a book he is compiling on mortars. Mr. Dibdin's offer was considered by the Committee, and on the 17th of March the Hon. Secretaries of the Committee wrote to the Secretary of the Institute as follows:—"We laid your letter of the 9th instant before this Committee on the following day, and while it is very satisfactory to find the labours of the Committee so well appreciated by such an authority as Mr. Dibdin, they are of the opinion that the Council should themselves publish the results as belonging to the Institute. To enable you to advise the Council thereon, the Committee propose that the results of the experiments on brickwork should be published in an octavo form, about 100 pages; that it should contain description of experiments undertaken, tables of results observed (58), compression diagrams (5), photographic illustrations (56), appendices by Professor Unwin, &c., papers on geology, chemistry, &c., of materials, summary and inferences as to respective strengths, &c., table of contents, index. The diagrams and photographic illustrations are all provided, the tabular work would be expensive, but all the rest would be ordinary printing." The Science Committee did not consider it justifiable to allow Mr. Dibdin to publish the results of a work which had been entirely carried on by members of the Institute, and they recommended the Council to that effect. The letter contained a clear statement of the nature of the work they proposed to publish, the number of pages, the nature of those pages and the illustrations. To that letter the Science Standing Committee had received no answer whatever from the Council. Further, in the Annual Report which the Science Committee sent in to the Council these words occurred: "And the Committee are awaiting the decision of the Council as to publishing an account of the whole of the experiments in an octavo form." But these words were omitted in the printed Report they were now discussing. Therefore he moved that the Report of the Science Standing Committee be added to in these words: after the words "the 13th of December" on the seventh line to add the words "and the Committee are awaiting the decision of the Council as to publishing an account of the whole of the experiments in an octavo form"; or, as an alternative, "That the words revised by the Council" be inserted under the heading of the Report of the Science Standing Committee.

Mr. JOHN HEBB [*F.*] said that might be a question between the Science Standing Committee and the Council, but he did not take this to be a question for the meeting. The Council were entrusted with a certain discretion in the publication of reports submitted to them, and it would be very imprudent for the meeting, who were perfectly un-

acquainted with the details of the question, to interfere and interpolate something which the Council deemed advisable to omit from the Report.

Mr. S. B. Beale [*A.*] hesitated to speak on a matter which, in its essence, was a question of specific policy between the Science Committee and the Council; but they were asked to pass the Annual Report, and so were afforded the only means of asking the question, and perhaps of arriving at a resolution in the direction they wished to go. The alternative form of Mr. Max. Clarke's amendment rendered it somewhat difficult to second, as he desired to do. Some explanation, however, was needed from the Council. The Council said they were waiting the pleasure of the Science Standing Committee; and the Science Standing Committee said they were waiting the pleasure of the Council. The Committee were anxious to publish these tests, and proposed to do so, and negotiations were entered into, in course of which the Committee were asked as to the best manner and form the work should be published. As a member of the Science Committee, and as a member of the General Body, one was entitled to know how the matter stood. It was desirable that the results of these experiments should be published in some concise form. If it were worth while for Mr. Dibdin to incorporate the whole series of experiments in his work, it should be worth while for the Council to do so. Therefore he asked what was the Council's position, and how did the question stand?

The Chairman thought the Institute should be congratulated on the interesting discussion that had taken place. If such discussions were more frequent it would have a great deal to do with filling the room at their meetings. Some apathy was undoubtedly manifested by members, and that had a great deal to do with the slow increase in their numbers. If a full room could be secured for every meeting, and a discussion in which the members would speak as well and as fully, and be as desirous for information as they had been that evening, their meetings would be the best allurement they could devise for bringing members into the Institute. With regard to the point raised by Mr. Woodward, as to the Council's power to use the funds of the Institute, Clause 16 of the Charter says: "The Council shall, subject to such limitations or restrictions as By-laws may from time to time prescribe, have the sole management of the income of the Royal Institute, and also the entire management and superintendence of all the other affairs and concerns thereof." Under that clause the Council had full powers to take the rooms upstairs, to furnish them, and to make them, as they hoped, a further inducement to members to join the Institute. During the protracted negotiations with the Allied Societies and architects in all parts of the kingdom, one reason they gave for so rarely attending the meetings was the waste of time that occurred when coming up to town in waiting possibly three or four hours before the meeting commenced, and they suggested that if there were a room they could wait in, and have tea and coffee, and see the architectural publications, it would be an inducement to come. That want the Council had endeavoured to meet. Some criticism had been levelled against the Institute in regard to its action concerning the plan for the improvements at Westminster; but looked at fairly, now the matter was settled, it would be seen that the Institute had had very great power, and that a good many of the suggestions offered by the Institute were adopted. Owing to the Institute's strenuous support of the parallel line in Whitehall being carried out right from the corner of Parliament Street, the fatal error originally proposed, viz. the canting off of the whole of the roadway, had been avoided. That was in a great measure due to the plan submitted by the Institute. Again, far from the Institute being lowered by what had happened, the Government had appealed to the President of the Institute to take a most important part in the selection of plans, and in advising the Government with regard to the new buildings. Therefore, that entirely disposed of any criticism with regard to the conduct of the Institute in the matter of the improvements at Westminster. With reference to the Report of the Science Standing Committee, when the matter came before the Council it was brought forward first in regard to Mr. Dibdin, and as to the publication in his volume. The Committee had thought it unadvisable to consent to that, and Mr. Dibdin had been advised accordingly. The clause Mr. Max. Clarke had read out as being omitted from the report was in the opinion of the Council premature. It involved a very large and important question of expenditure, which had been considered by the Finance Committee; and as there was need for further revision, and the proposal would entail very heavy expenditure indeed, it was thought that the question, being still undecided, would be referred back to the Committee to make further inquiries, and therefore it was premature to bring the matter in its present state before the Institute. He must add that it had never been the custom, nor could it be expected that the Council should print every word that came up to them in the form of a report from a Committee. A Committee naturally looked at a thing from its own point of view, and was not always in possession of the evidence which came before the Council. Though verbal alterations might have to be made in a report—and even, for good reason, an omission—yet it might still be considered practically the report of the Committee. At the same time, he was quite willing to admit that the wording in capitals at the head of the Report was scarcely advisable in all circumstances, and possibly some objection might be taken to it.—In answer to further questions, the Chairman stated that the decision of the Council to which he had referred had only been arrived at that afternoon; that there appeared to have been some misapprehension about the matter, which he hoped had now been cleared up, so that the business would proceed more rapidly.

Mr. Delissa Joseph [*F.*] asked permission to say a few words on the Report before the discussion closed. The general impression the Report left on his mind was a sense of deep disappointment. It seemed to him that the Report might be summed up as a record of many things attempted, and few accomplished. Many of the paragraphs were full of promise, but ended in nothing. One thing, however, was clear. The Council had proved itself to be an admirable administrative body. Its success in dealing with the finances of the Institute clearly proved that. But the Council was wanting in initiative; and when one found an administrative Council of an institution wanting in initiative, the first thought that occurred to one was that new blood might sometimes advantageously be introduced. With regard to the introduction of new blood, what was the real difficulty? It seemed to be this. About this time each year the Council issued a house list of nominations. That practically discouraged independent members from formulating their own independent nominations for the Council; for what use was it to members to put up those that they thought would be fit for the post in the face of this strong nomination? He did not know whether the By-laws could be altered to meet the point, but he thought the procedure should be something as follows. Just before the election a memorandum should be sent out to all members inviting nominations for the new Council. Then the names of those nominated by the general body should appear on the joint list; that is, independent nominations and the nominations of the Council itself. That was a point which should be further considered, and one which he believed would encourage the general body to take more interest in the affairs of the Institute. Such an insti-

tution as theirs should do something more to attract, and more particularly, as he had said at last year's Annual Meeting, to popularise architecture. The general impression one got was that architecture was probably the most misunderstood of the arts among the populace, and he could not help feeling that the Institute might do something to make the art more popular among the general public. The Council again should not limit itself to bringing up a report of the whole of the things that were done or attempted to be done in the past year; they should lay before the general public something approaching a statement, or a programme of policy for the future.

The CHAIRMAN said that, in regard to the nominations, he had forgotten to mention some of the points for the Council list. Members were not aware of the difficulties of getting new names. Numbers of gentlemen whose position and work made their presence on the Council desirable were applied to, but, though expressing themselves flattered and pleased at the invitation, they decline, because they have not the time to spare for the long meetings. The Council had taken the initiative in this very question. The election of members of the Council had recently been discussed at the Council, and one of its Committees had had greatly extended powers given to it to prepare for any elections, for any office, or for any reward; it had been given power to compel the Council to bring forward questions, to ascertain what work was being done, and to prepare lists showing those who were fit and desirable for office. It was too late to do anything this year, as the list had already been prepared; but a Committee had been appointed with full power to deal with the matter in future. It should be mentioned, with regard to members whose names appeared on the list for many consecutive years, that, though they did not often attend the general meetings, they did much valuable work on the Committees. The Report could give no details of the work done by Committees of the Council. But to take one Committee only—the Finance Committee: a glance at the long statements of account must make it evident to anyone that a great deal of time and attention must be given from year to year to the subject of finance. A new man coming on was practically of no use on a committee which had to deal with accounts and statements, knowledge of which must extend over many years. The Council, however, always brought forward a certain number of fresh names, and members had an opportunity of adding others to the list. Whether, in the future, it might not be the duty of the Council to suggest that a certain number of its members should retire every year, he was unable to say. The new Committee he had mentioned had not met yet, but he had no doubt that subject would be considered by them. The subject, however, had its difficulties, because it might happen that the three members most intimately acquainted with the Institute, and cognisant of all its affairs, would be the three compelled to retire. So there was something to be said against any alteration in the method of nomination.

Mr. E. W. HUDSON [*A.*] thought the Chairman's announcement not the least result of importance arising out of the discussion: had it been made in the Report a part of the criticism aimed at it would have been disarmed. It would have shown that not only were the Council a good administrative body, but that it was also seeking the advancement of the Institute by taking the initiative in a very important matter.

The CHAIRMAN, asked by Mr. Wm. Woodward to say a few words with regard to the alterations in Russell Square and the Art Committee's protest, observed that he was unwilling to add his opinion to either side, knowing that he must offend half the meeting; therefore as everyone must be a judge for himself as to whether Russell Square was in course of improvement or not, he would say nothing about it.

Mr. JOHN SLATER, B.A.Lond. [*F.*], thought the meeting should not separate without congratulating themselves and their past President, Mr. Penrose, upon the honour conferred upon him in being elected Antiquary to the Royal Academy. It must have been most gratifying to Professor Aitchison to have heard the statement made by Sir Edward Poynter on Saturday, as it was to all of them who had read the announcement.

THE CHAIRMAN, having proposed that the question of the adoption of the report should be put,

Mr. SYDNEY B. BEALE [*A.*] referred again to the matter of the clause omitted from the Report of the Science Standing Committee, and asked that a statement should be added that the Council were considering the advisability of publishing the results of the brickwork experiments as recommended by the Committee.—After some further discussion, contributed to by the Chairman, Messrs. Max. Clarke, Sydney Beale, C. B. Brodie, Matt. Garbutt, R. Phenè Spiers, John Slater, and the Hon. Secretary, in the course of which a tribute of appreciation was paid by the two last named for the generous services the Committee had rendered the Institute in carrying out the tests, it was agreed on the motion of the Hon. Secretary, seconded by Mr. Matt. Garbutt, that a footnote should be inserted in the Report stating that the Council would consider the advisability of publishing the results of the experiments in the form suggested by the Committee.

The CHAIRMAN having mentioned that the President's name had been inadvertently omitted from the item in the Art Committee's Report referring to the New Government Offices Scheme, where it should appear along with the names of Messrs. Alfred Waterhouse and Macvicar Anderson, directed that the name should be inserted.

The Report was then adopted, and further business concluded as notified in the Minutes [p. 359].

ALLIED SOCIETIES.

The Sheffield Society and its Work.

The Annual Report of the Allied Society at Sheffield, read at the Annual Meeting of that body on the 26th April, shows the Society to be in a very flourishing condition. Notwithstanding exceptional expenditure for lectures, library additions, and conversazione, the Council are able to report a balance of over £120, £100 of which is to be invested to form the nucleus of a reserve fund. The membership shows a net increase of eight during the year, the Society now numbering 114 members—viz. 31 Fellows, 43 Associates, 18 Students, 5 Honorary, and 17 Lay Members. The Council have deemed it prudent, by reason of recent valuable additions to the Library, to insure the Society's property; and in order to facilitate the free use of the Library its charge has been undertaken by three members—Messrs. L. D. Hemsoll, S. L. Chipling, and W. J. Beall. A welcome donation of £5 to the funds for improving the Library has been made by another member, Mr. E. M. Eaton, Assoc.M.Inst.C.E.

The Papers read during the Session have been of sterling value, and highly appreciated, securing an attendance averaging about double that of former years, and being well reported in the local and professional press. The subjects treated include "Eighteenth Century Architecture," by Mr. J. A. Gotch [*F.*], F.S.A.; "The Warming of Public Buildings," by Mr. F. R. Farrow, printed *in extenso* in this issue of the JOURNAL [pp. 347–55]; "Sanitary Engineering in Connection with Buildings," by Mr. W. C. Fenton; "Proportion," by Mr. Hugh Stannus [*F.*]; and "English and Foreign Timber for Building and Decoration," by Mr. C. Castle.

At the annual summer excursion the Society visited Chatsworth, where, by the courtesy of the Duke of Devon-

shire, who is an Honorary Member of the Society, the members were accorded the privilege of inspecting the private apartments, as well as those open to ordinary visitors.

At the instance of the Hon. Secretary, Mr. C. J. Innocent [*F.*], several meetings of junior members were held to discuss ways and means of organising classes for the study of scientific subjects, resulting in the Council's arranging for a course of ten lectures by Mr. Hugh Stannus [*F.*], Lecturer at the Royal College of Art, on "The Classic Elements of Architecture." The results were encouraging; students to the number of 43 joined the classes, and so full of interest were the lectures that the attendance was exceptionally well maintained throughout the course. The lecturer treated his subject under the following heads:—

Mouldings.—Origin, Function, Names, Individual Treatment; The Mouldings in Groups; Modifications; Application to Features.
The Walls.—Proportion; Thickness; Fenestration.
The Order.—Sub-divisions; Application; Pediments.

The Report states that this is one of the best means of education the Society has engaged in, and has sufficiently proved that the younger members are willing to devote their time to self-improvement in their profession when a good opportunity is afforded them.

In professional matters the report shows equally satisfactory work. The assistance of the Society was sought by the Corporation of Sheffield in the competition for the police and fire-brigade station of that city—a competition limited to members of the Society practising in Sheffield. Mr. Charles Hadfield [*F.*], the then President, Mr. E. M. Gibbs [*F.*], ex-President, and Mr. C. J. Innocent [*F.*], Hon. Secretary, drew up the instructions to competitors, and reported on the designs submitted. Their report was adopted by the City Council, and it is stated the successful conduct of this competition has given more than usual satisfaction. In an important competition connected with the Woofindin Trust, also limited to members of the Society, the Council were invited to revise the Conditions and Instructions, and their suggestions were adopted by the Trustees; Mr. E. M. Gibbs [*F.*] acted as Assessor. Owing to the representations of the Council improved terms were gained for the School Board Competition. With regard to the Building By-laws of the city, the Council have approached the Corporation with a suggestion that if any alterations or additions were contemplated the Council should have an opportunity of perusing the draft and making suggestions thereon.

Questions having been raised between individual members and the Sheffield Master Builders' Association, the Council convened a meeting of members to consider the matter, and the following resolutions were passed:—

1st. That the deposit of Priced Schedules or Priced Bills of Quantities with each tender submitted is not usual or desired. That the successful contractor does, and should continue to, deposit with the Architect or Surveyor a Priced Schedule or Priced Quantities to be used by him for all the purposes of the contract, and for those purposes only.
2nd. That as the execution of work within a stipulated time is of the essence of the contract, liquidated damages must be provided for in the agreement, subject to extension of time for bad weather, fire, and strikes of workmen.
3rd. That the Architect for the building is usually the Arbitrator in the event of any dispute, and should continue so to be.

These resolutions were forwarded to and discussed by the Builders' Association, who agree that the first and second clauses might be arranged, but that there must be a full and open arbitration clause. Deputations from the two Societies are to meet and discuss the point in dispute.

The Report, the leading items only of which have been here touched upon, concludes with the regrettable announcement of the resignation of the Hon. Secretary, Mr. C. J. Innocent, who for four years has devoted himself unsparingly to the service of the Society, and to whom, as Mr. Fowler's remarks quoted below suggest, its present flourishing condition is largely due. A very cordial vote of thanks to Mr. Innocent was passed by the Society, on the motion of the President, seconded by the Vice-President. Mr. Fowler, the Hon. Treasurer, said that when Mr. Innocent accepted the office four years ago there were 69 members, and now there are 114; the balance in hand at that time was £4, and now it is £121. No one could have worked better for the Society than Mr. Innocent, no one could have done so much honorary work, and his efforts had placed the Society in an exceptionally prosperous and influential position.

In acknowledging the vote, Mr. C. J. Innocent said it had been a pleasure to him to work for the Society, and to see it prosper, and he thought the Council might be congratulated, not only upon what had been done, but also upon what had not been done, for if every suggestion that had been made by enthusiastic persons had been acted upon, the Society might not now stand in the amicable relation to other bodies which it now occupied.

It was decided that in future some paid assistance should be provided for the Hon. Secretary.

The result of the subsequent ballot for the officers for the ensuing session appears below. In this connection may be noted a change in the composition of the Council, which came into operation at the recent election. Hitherto, in addition to the officers and elected members of the Council, the past Presidents have been members *ex-officio*, four Fellows and one Associate being elected. Now, according to the altered rule, only the ex-President, that is, "the latest past President," will be retained on the Council without election in addition to the officers and the elected members, viz., four Fellows and two Associates.

OFFICERS AND COUNCILS 1898–99.

The Aberdeen Society.

President, Mr. James Souttar; *Vice-President*, Mr. Arthur Clyne; *Hon. Sec.* and *Treasurer*, Mr. John Rust; *Members of Council*, Messrs. William Kelly, A. M. Mackenzie [*F.*], A.R.S.A., A. H. L. Mackinnon [*A.*], George Watt, and R. G. Wilson.

The Leicester Society.

President, Mr. A. E. Sawday [*F.*]; *Council*, Messrs. C. Baker, J. Goodacre [*F.*], A. H. Paget [*F.*], H. H. Thomson [*A.*], W. A. Catlow, and R. W. Bedingfield [*A.*]; *Hon. Treasurer*, Mr. S. Harrison [*F.*]; *Hon. Secretary*, Mr. S. Perkins Pick [*A.*].

The Northern Association.

President, Mr. F. W. Rich; *Vice-President*, Mr. W. Glover; *Hon. Treasurer*, Mr. J. T. Cackett [*F.*]; *Hon. Secretary*, Mr. A. B. Plummer [*F.*]; *Hon. Solicitor*, Mr. H. C. Harvey; *Hon. Librarian*, Mr. H. C. Charlewood [*F.*]; *Council*, Messrs. H. G. Badenoch, Frank Caws [*F.*], A. M. Dunn, W. S. Hicks, Joseph Oswald [*F.*], J. W. Taylor [*F.*], R. B. Dick, and C. S. Errington [*A.*]; *Auditors*, Mr. J. W. Donald [*A.*], and W. E. Fenwicke.

The Nottingham Society.

President, Mr. A. N. Bromley [*F.*]; *Vice-President*, Mr. A. H. Goodall; *Council*, Messrs. Herbert Walker, A. E. Heazell, Arthur Marshall [*A.*], A. W. Brewill [*F.*], and J. Sander [*A.*]; *Auditors*, Messrs. A. W. Brewill, and H. Blatherwick.

The Sheffield Society.

President, Mr. R. W. Fowler; *Vice-President*, Mr. J. Smith; *Treasurer*, Mr. F. Fowler; *Hon. Secretary*, Mr. W. C. Fenton; *Council*, Messrs. Charles Hadfield [*F.*], E. M. Gibbs [*F.*], C. J. Innocent [*F.*], T. Winder, Assoc.M.Inst.C.E.; A. Smith Denton, J. R. Wigfull [*A.*], and J. B. Mitchell-Withers [*A.*].